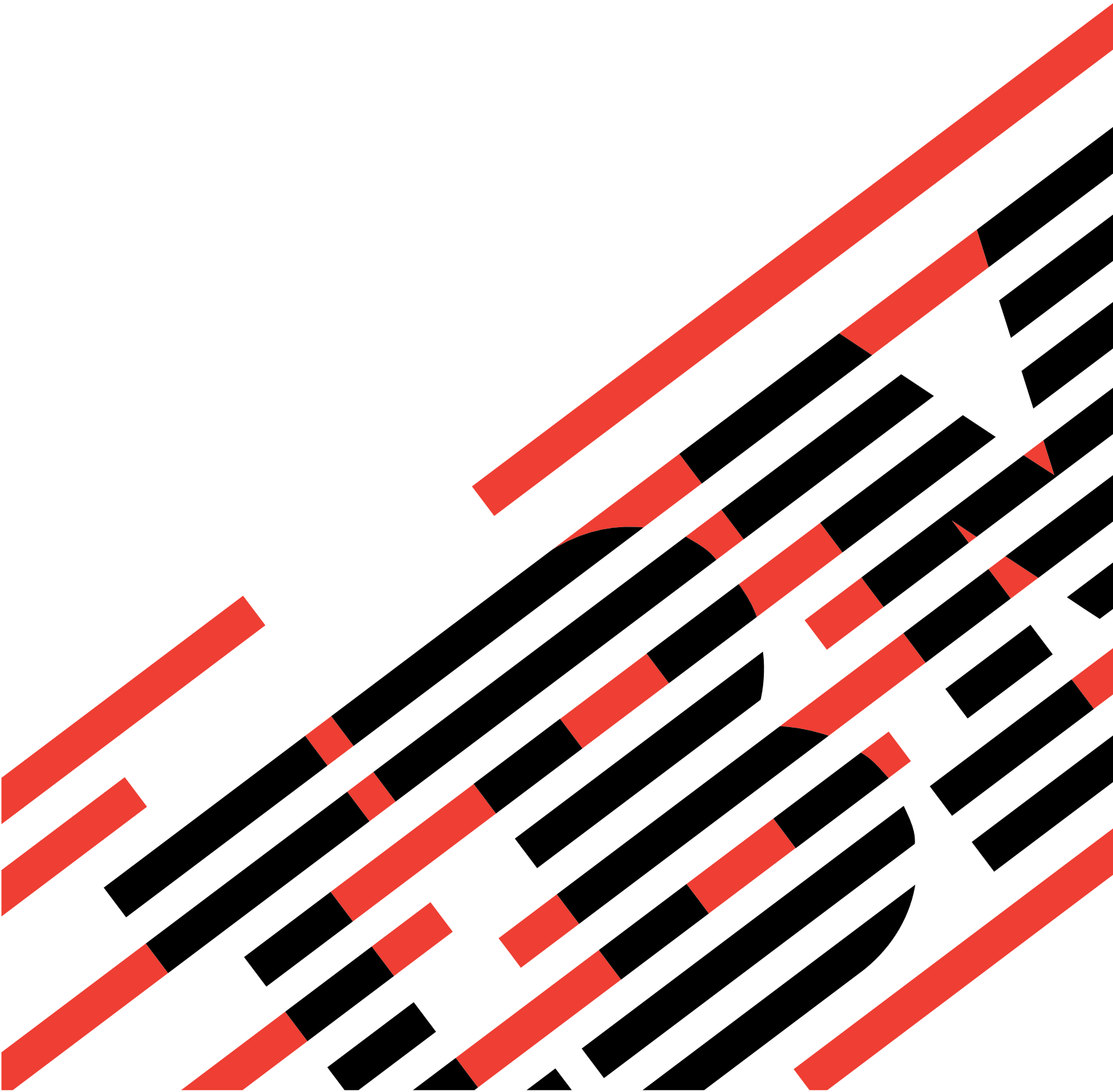
IBM eServer xSeries x382
Type 8834

Hardware Maintenance Manual and Troubleshooting Guide



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Note

Before using this information and the product it supports, read Appendix C, “Notices”, on page 135.

The most recent version of this document is available at http://www.ibm.com/pc/support.

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, error messages, and configuration information for the IBM® @server xSeries x382 Type 8834 server.

To diagnose server problems, always start with “General checkout” on page 21.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM xSeries products. See the parts listing in “System” on page 92 to determine if the component being replaced is a customer replaceable unit (CRU) or a field replaceable unit (FRU).

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions. See “Safety information” on page 95.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

在安装本产品之前，请仔细阅读 Safety Information
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. ***Lávese las manos después de usar el producto.***

Online support

You can download the most current diagnostic, BIOS flash, and device driver files from http://www.ibm.com/pc/support on the World Wide Web.

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Contents

About this manual iii
Important safety information iii
Online support iii

Chapter 1. General information 1
Notices and statements used in this book 1
Related publications 2
Features and specifications 3
What your server offers 4
Updating device drivers 5
Controls and LEDs 6
Server power features 8
Turning on the server 8
Turning off the server 9
Major components of your server 10
Option connectors 12
Internal connectors 13
External connectors 15

Chapter 2. Configuring your server 17
Using the Configuration/Setup Utility program 17
Starting the Configuration/Setup Utility program 17
Password 18
Using the LSI Logic Configuration Utility program 18
Starting the LSI Logic Configuration Utility program 18
Formatting a SCSI hard disk drive 19
Using ServeRAID Manager 19
Configuring the Gigabit Ethernet controller 20
Updating BIOS 20

Chapter 3. Diagnostics 21
General checkout 21
SEL overview 22
EFI-based SELViewer task 23
xSeries 382 SEL data tables 23
xSeries 382 machine check error handling 25
Classification of errors 25
Error types 26
Error signaling 26
Error reporting 27
Thresholding 28
SEL event log format for machine check errors 29
xSeries 382 PCI device IDs 31
POST error codes and messages 32
Debug methodology and FRU isolation 32
Memory 32
Microprocessor debug methodology: 33
Microprocessor FRU isolation 34
Microprocessor - Late Self-test 34
Late self-test display 34
Late self-test usage notes 34
Watch dog timer 35
Fault resilient boot (FRB) 35

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FRB3 - BSP reset failures . . . 35
FRB2 - BSP POST failures. . . . 35
FRB1 - BSP self-test failures. . . . 36
FRB debug methodology: . . . 36
FRB FRU isolation . . . 37
POST codes . . . 37
Beep Codes . . . 37
Running system diagnostics . . . 37
Setting test options . . . 38
Interpreting test results . . . 38
Getting help on individual tests . . . 38
Viewing system information . . . 38
Viewing the test log . . . 38
EFI service partition . . . 39
Service partition requirements . . . 39
Installing service partition files . . . 39
Installation requirements . . . 39
Installing the files . . . 40
Booting the server from the service partition . . . 40
Memory errors . . . 40
Error symptom charts . . . 41
Small computer system interface messages . . . 41
Clearing CMOS. . . . 41
BIOS recovery mode. . . . 42
Support telephone numbers . . . 42

Chapter 4. Customer replaceable units . . . 43
Installation guidelines . . . 43
System reliability guidelines . . . 43
Handling static-sensitive devices . . . 44
Removing the bezel . . . 45
Installing internal drives. . . . 45
Installing a hot-swap drive. . . . 46
Completing the installation. . . . 47
Replacing the bezel . . . 47
Cabling the server. . . . 48
Updating your server configuration. . . . 48

Chapter 5. Service replaceable units . . . 49
Cover removal and replacement . . . 49
Working with adapters . . . 50
Adapter considerations . . . 50
CD-ROM drive removal and replacement . . . 51
Hot-swap fan removal and replacement. . . . 52
Hot-swap power supply removal and replacement . . . 54
Fan assembly and air baffle removal and replacement . . . 56
PCI riser assembly removal and replacement. . . . 57
Adapter removal and replacement. . . . 60
Memory DIMMs removal and replacement. . . . 63
Front panel board removal and replacement . . . 65
SCSI backplane removal and replacement. . . . 66
Peripheral bay removal and replacement . . . 67
Power supply bay removal and replacement . . . 68
System board removal and replacement . . . 70
System board componets . . . 72
System board jumpers . . . 73

Microprocessor removal and replacement 74
Power pod removal and replacement 75
System battery 76
Battery removal and replacement 76

Chapter 6. Symptom-to-FRU index 79
Beep codes 79
Recovery beep codes 80
BMC generated beep codes 80
Error codes - video display 81
Error symptoms 86
Power supply LED errors 87
SCSI error codes 87
Undetermined problems 88
Problem determination tips 89

Chapter 7. Parts listing, x382 Type 8834 (models 11X and 32X) 91
System 92

Appendix A. Getting help and technical assistance 93
Before you call 93
Using the documentation 93
Getting help and information from the World Wide Web 93
Software service and support 94
Hardware service and support 94

Appendix B. Related service information 95
Safety information 95
General safety 95
Electrical safety 96
Safety inspection guide 97
Handling static-sensitive devices 98
Grounding requirements 98
Safety notices (multilingual translations) 99

Appendix C. Notices 135
Edition notice 135
Trademarks 136
Important notes 136
Product recycling and disposal 137
Electronic emission notices 137
Federal Communications Commission (FCC) statement 137
Industry Canada Class A emission compliance statement 138
Australia and New Zealand Class A statement 138
United Kingdom telecommunications safety requirement 138
European Union EMC Directive conformance statement 138
Taiwanese Class A warning statement 139
Chinese Class A warning statement 139
Japanese Voluntary Control Council for Interference (VCCI) statement 139
Power cords 139

Index 143

Chapter 1. General information

The IBM @server xSeries x382 Type 8834 server is a high-performance server based on IBM X-Architecture™ technologies. It is symmetric multiprocessing (SMP) capable, if this feature is supported by your operating system. It is ideally suited for networking environments that require superior microprocessor performance, efficient memory management, flexibility, and large amounts of reliable data storage.

Your server contains several IBM X-Architecture technologies, which provide increased performance, reliability, and availability. The X-Architecture technologies provided in your server include the recent advancements in X-Architecture features. For more information about the X-Architecture features, see “What your server offers” on page 4. You can obtain more information about the IBM X-Architecture technologies and features at http://www.ibm.com/pc/us/eserver/xseries/xarchitecture/.

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of your server. These design features make it possible for you to customize the system hardware to meet your needs today, while providing flexible expansion capabilities for the future.

You can obtain up-to-date information about your server model and other IBM server products at http://www.ibm.com/pc/us/eserver/xseries/.

Note: The illustrations in this document might differ slightly from your hardware.

Notices and statements used in this book

The caution and danger statements that appear in this book are also in the multilingual *Safety Information* book, which is on the IBM *xSeries Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* book.

The following notices and statements are used in the documentation:

- **Notes:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

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Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* provide information to help you solve the problem yourself or to provide helpful information to a service technician. In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following documentation comes with your server:

- *Installation Guide*
  This printed publication contains setup and installation instructions.
- *User's Guide*
  This publication is provides general information about your server, including information about features, how to configure the server, how to use the *Resource* CD, and how to get help.
- *Safety Information* book
  This multilingual publication is provided in PDF on the IBM *xSeries Documentation* CD. It contains translated versions of the caution and danger statements that appear in the documentation for your server. Each caution and danger statement has an assigned number, which you can use to locate the corresponding statement in your native language.

Depending on your server model, additional publications might be included on the IBM *xSeries Documentation* CD and the *Resource* CD.

Your server might have features that are not described in the documentation that you received with the server. The documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in your server documentation. These updates are available from the IBM Web site. Complete the following steps to check for updated documentation and technical updates:

1. Go to http://www.ibm.com/pc/support/.
2. In the **Learn** section, click **Online publications**.
3. On the "Online publications" page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **xSeries 382**.
5. Click **Display documents**.

Features and specifications

The following information is a summary of the features and specifications of your server. Depending on your server model, some features might not be available, or some specifications might not apply.

Use the Configuration/Setup Utility program to determine the type and speed of the microprocessor that is in your server.

Table 1. Features and specifications

Microprocessor:
- Intel Itanium 2 processor
- Level-3 cache
- 400 MHz front-side bus (FSB)
- Support for two microprocessors

Memory:
- Minimum: 1 GB
- Maximum: 16 GB
- Type: PC2100, double-data-rate (DDR)
- Connectors: eight dual inline memory module (DIMM) connectors, four-way interleaved

Drives standard:
- DVD/CD-RW combo: EIDE
- One or two hot-swap SCSI hard disk drives, depending on server model

Expansion bays:
- Two open hot-swap, slim-high, 3.5-inch drive bays (one or two SCSI drives installed, depending on server model)

PCI expansion slots:
- Two PCI-X 100 MHz/64-bit, full-length
- One PCI-X 133 MHz/64-bit, full-length

Cooling:
Six speed-controlled fans

Upgradeable microcode:
BIOS upgrades (when available) can update EEPROMs on the system board

Integrated functions:
- Dual Gigabit Ethernet controller on the system board with two RJ-45 Ethernet ports
- One serial port (RJ-45)
- Integrated SCSI controller with one external Ultra320 SCSI port
- Four Universal Serial Bus (USB) v1.1 ports (two on front and two on rear of enclosure)
- ATA-100 single-channel IDE controller
- Two VGA video connectors (one on front and one on rear of enclosure)
- USB keyboard and mouse support

Failure LEDs:
- System status/fault
- Power
- Disk drive
- Fans

Power supplies:
- Two non-redundant hot-swap 350-watt output (115-230 V ac) for 700-watt total output
- Some server models come with a third 350-watt hot-swap power supply that provides 2+1 redundancy

Electrical input:
- Sine-wave input (50 or 60 Hz) required
- Input voltage and frequency ranges automatically selected
- Input voltage low range:
  - Minimum: 100 V ac
  - Maximum: 127 V ac
- Input voltage high range:
  - Minimum: 200 V ac
  - Maximum: 240 V ac
- Input kilovolt-amperes (kVA) approximately:
  - Minimum: 0.15 kVA (all models)
  - Maximum: 0.80 kVA with two power supplies, 0.62 kVA with three redundant power supplies

Heat output:
Approximate heat output is 2259 British thermal units (Btu) per hour (662 watts) for the maximum server configuration.

Environment:
- Air temperature (operating): 10° to 35°C (50° to 95°F)
- Humidity (storage): 50% to 90% non-condensing

Acoustical noise emissions:
- Sound power, idle: 7.0 bel maximum
- Sound power, operating: 7.0 bel maximum

Size:
- Height: 87 mm (3.4 in.)
- Depth: 747 mm (29.4 in.)
- Width: 449 mm (17.7 in.)
- Weight: 30 kg (65 lb) when fully configured

What your server offers

Your server takes advantage of advancements in symmetric multiprocessing (SMP), data storage, disk-array technologies, and memory management. Your server includes:

- **IBM Enterprise X-Architecture technology**

  IBM X-Architecture technology combines proven, innovative IBM designs to make your Intel-processor-based server powerful, scalable, and reliable. X-Architecture design includes Chipkill™ memory, hot-swappable hard disk drives, hot-swappable power supplies if your server comes with three power supplies installed, and Predictive Failure Analysis® capability.

- **Impressive performance using SMP**

  Your server supports two Intel Itanium 2 microprocessors installed for enhanced performance and SMP capability.

- **Large data-storage and hot-swap capabilities**

  Your server supports up to two 25.4-mm (1-inch) slim-high, 3.5-inch hot-swap hard disk drives in the hot-swap bays. With the hot-swap feature, you can add, remove, or replace hard disk drives without turning off the server.

- **Redundant power capabilities**

  Some server models provide redundant power capability. Your server comes with two or three 350-watt hot-swap power supplies. Three power supplies provide redundant power: if the average load on your server is less than 700 watts and a problem occurs with one of the power supplies, the remaining two power supplies can handle the load.

- **Large system-memory capacity**

  Your server supports up to 16 GB of system memory. The memory controller provides error correcting code (ECC) support for up to eight industry-standard, 133 MHz, 2.5 V, 184-pin, double-data-rate (DDR), PC2100 registered, synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs). The memory controller provides Chipkill memory protection if all DIMMs are type x4. Chipkill memory protection is a technology that protects the server from a single chip failure on a DIMM.

- **Alert on LAN**

  Your server supports Alert on LAN technology, which provides notification of changes in the server system even when the computer is turned off. Working with desktop management interface (DMI) technology, Alert on LAN helps manage and monitor the hardware and software features of your server.

  Alert on LAN generates notifications when an error is detected during POST or the server is disconnected from the network or disconnected from the electrical outlet.

- **Serial over LAN**

  Your server supports Serial over LAN technology, which provides advanced remote management capability. It provides the ability to redirect server serial data over a LAN without the use of serial concentrators. It also eliminates the need for serial cabling by internally rerouting serial packets over the LAN. The Serial over LAN feature enables redirection of both the BIOS and operating system consoles to a remote client console to provide remote administration and eliminate the need for a dedicated monitor and keyboard. The Serial over LAN feature does not require any special client software because it is designed to work with existing standard Telnet consoles.

- **Integrated network support**

  Your server comes with an integrated dual-channel Gigabit Ethernet controller on the system board. This Ethernet controller has an interface for connecting to a 10-Mbps, 100-Mbps, or 1-Gbps network. The server automatically selects between 10BASE-T and 100/1000BASE-TX environments. The controller provides full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on an Ethernet local area network (LAN).
- **Redundant connection**

  The dual-channel Ethernet controller on the system board provides a failover capability to a redundant Ethernet connection. If a problem occurs with the primary Ethernet connection, all Ethernet traffic associated with the primary connection is automatically switched to the redundant Ethernet connection. If the appropriate device drivers are installed, this switching occurs without data loss and without user intervention.
- ***Resource CD***

  The *Resource CD* that comes with your server provides programs to help you set up and maintain your server.
- **ServeRAID support**

  Your server supports IBM ServeRAID adapters to create an external redundant array of independent disks (RAID) configuration.

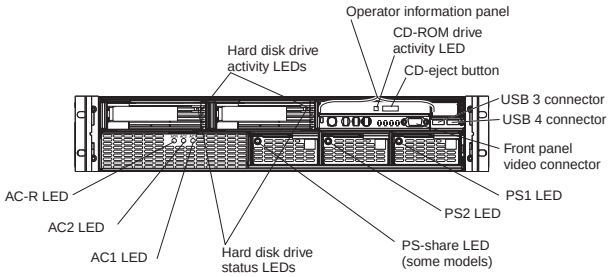
Updating device drivers

Device drivers for IBM devices and the instructions to install them are on the *Resource CD*.

Before you can recover or install device drivers, your operating system must be installed on your computer. Make sure that you have the documentation and software media for the device. The latest device drivers are also available at http://www.ibm.com/pc/support.

Controls and LEDs

The following illustrations show the controls and LEDs on the front of the server.



Hot-swap hard disk drive activity LED

On some server models, each hot-swap drive has a hard disk drive activity LED. When this green LED is flashing, it indicates that the drive is in use.

Hot-swap hard disk drive status LED

On some server models, each hot-swap drive has a hard disk drive status LED. When this amber LED is lit, it indicates that the drive has failed.

DVD/CD-RW drive activity LED

When this LED is lit, it indicates that the DVD/CD-RW drive is in use.

CD-eject button

Press this button to release a CD or DVD from the DVD/CD-RW drive.

Hard disk drive activity/failure LED

When this amber LED is lit continuously (not flashing), it indicates a hard disk drive failure.

Ethernet1/Ethernet2 activity LEDs

There are two Ethernet activity LEDs, one for each Ethernet controller in your server. When each LED is lit, it indicates that there is activity between one of the Ethernet controllers and the network.

AC1 power LED

When this LED is lit, it indicates that the AC1 power cord is connected to an ac power source.

AC2 power LED

When this LED is lit, it indicates that the AC2 power cord is connected to an ac power source.

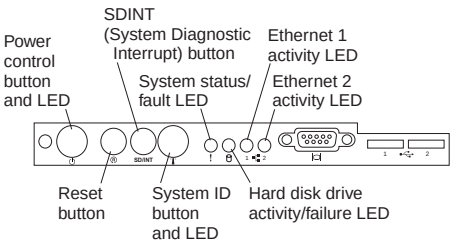
AC-R power LED

When this LED is lit, it indicates that both the AC1 and AC2 power cords are connected to an ac power source and three power supplies are installed in the server. It indicates that the server is operating with redundant power.

PS1/PS2/PS-share power LEDs

This LED is on each hot-swap power supply. When this LED is lit, it indicates that the power supply is installed and providing dc power to the server. During typical operation for a server with two power supplies, both the AC1 and AC2 power LEDs and both the PS1 and PS2 power LEDs are lit. During typical operation for a server with three redundant power supplies, both the AC1 and AC2 power LEDs and the PS1, PS2, and PS-share power LEDs are lit. For any other combination of LEDs, see “Power supply LED errors” on page 87.

The following illustration shows the controls and LEDs on the operator information panel.



Power-control button/power-on LED

Press this button to turn the server on and off manually. The power-on LED is in the center of the power-control button. When this LED is lit, it indicates that the server is turned on. When this LED is off, it indicates that the server is off or that the server is disconnected from its power source.

Reset button

Press this button to perform a hardware reset of the server and run the power-on self-test (POST).

SD/INT button

Press this button to initiate a system diagnostic interrupt. See “Running system diagnostics” on page 37.

System ID button and LED

Press this button to turn the system ID LEDs on and off, as an aid in visually locating the server. This LED can also be turned on remotely by the system administrator. There are system ID buttons and LEDs on the front and rear of the server.

System status/fault LED

When this green LED is lit continuously (not flashing), it indicates normal operation and that no system errors have occurred.

Hard disk drive activity/failure LED

When this amber LED is flashing, it indicates that a hard disk drive is in use. When this LED is lit continuously (not flashing), it indicates a hard disk drive failure.

Ethernet1/Ethernet2 activity LEDs

There are two Ethernet activity LEDs, one for each Ethernet controller in your server. When each LED is flashing, it indicates that there is activity between one of the Ethernet controllers and the network. The LEDs are off if there is no Ethernet connection and are lit continuously if there is a connection with no activity. Ethernet link status and speed LEDs are also on each Ethernet connector on the rear of the server.

Server power features

When the server is connected to an ac power source but is not turned on, the operating system does not run, and all core logic is shut down; however, the server can respond to remote requests to turn on the server. The power supply LEDs flash to indicate that the server is connected to an ac power source but is not turned on (standby mode).

Turning on the server

Notes:

1. Turn on all external devices, such as the monitor, before turning on the server.
2. The power-on LED on the front of the server is lit when the server is on and while it is powering up.

Approximately 10 seconds after the server is connected to ac power, the power-control button becomes active, and you can turn on the server and start the operating system by pressing the power-control button. If a power failure occurs while the server is turned on the server maybe configured to restart automatically when power is restored. See System Maintenance Utility on your Resource CD for configuring power options.

Note: When 4 GB or more of memory (physical or logical) is installed, some memory is reserved for various system resources and is unavailable to the operating system. The amount of memory that is reserved for system resources depends on the operating system, the configuration of the server, and the configured PCI options.

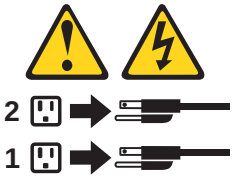
Turning off the server

When you turn off the server and leave it connected to ac power, the server can respond to remote requests to turn on the server. To remove all power from the server, you must disconnect it from the power source.

Operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

Statement 5

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Note: After turning off the server, wait at least 5 seconds before you press the power-control button to turn on the server again.

The server can be turned off in any of the following ways:

- After the operating system is shut down, or if the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- The server can be configured to turn itself off as an automatic response to a critical system failure.

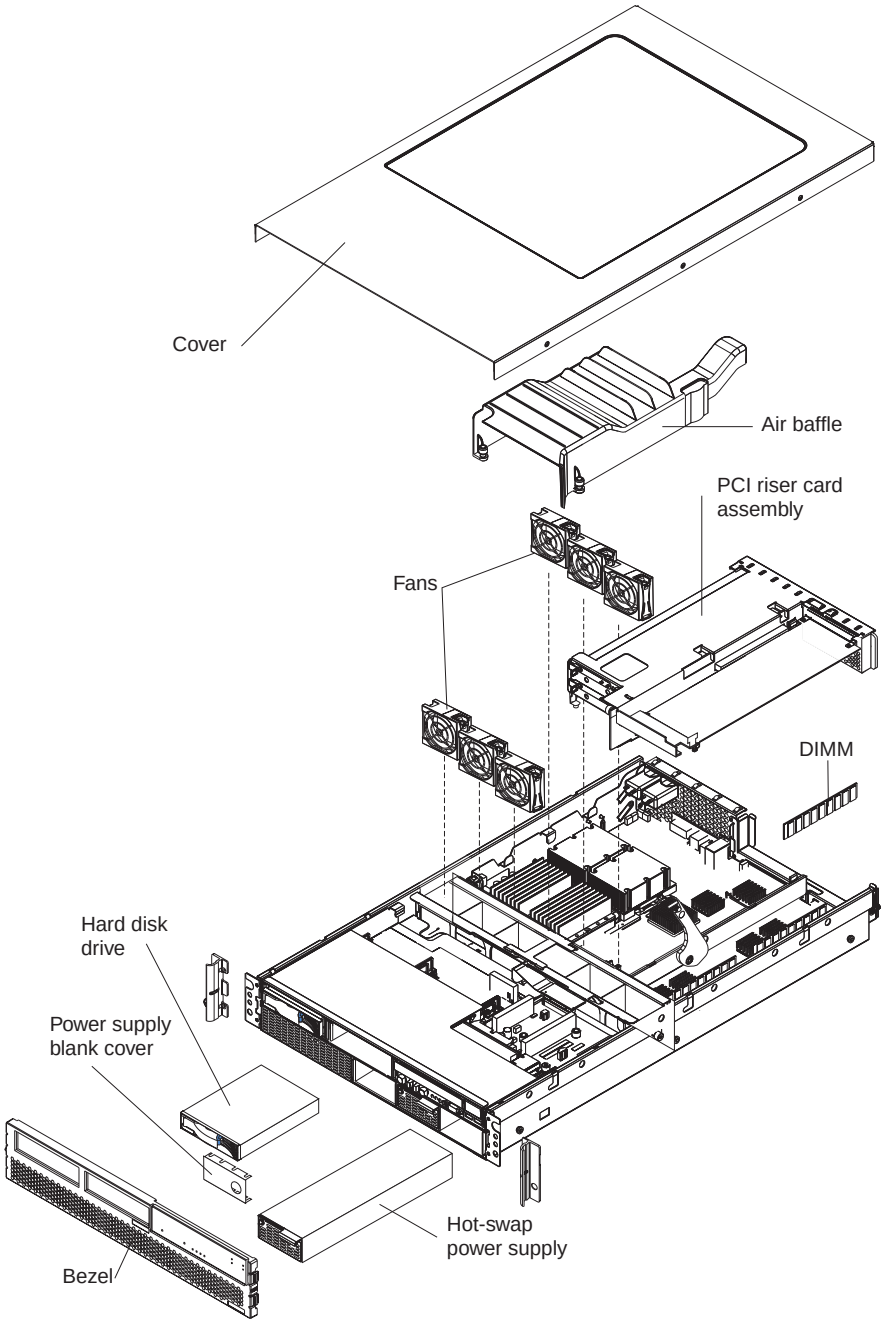
Major components of your server

The orange color on components and labels in your server identifies hot-swap or hot-plug components. You can install or remove these components while the server is running, provided that the server is configured to support hot-swap and hot-plug features. For complete details about installing or removing a hot-swap or hot-plug component, see the information in Chapter 4, “Customer replaceable units”, on page 43.

The blue color on components and labels indicates touch points where a component can be gripped, a latch moved, and so on.

The following illustration shows the major components in the server.

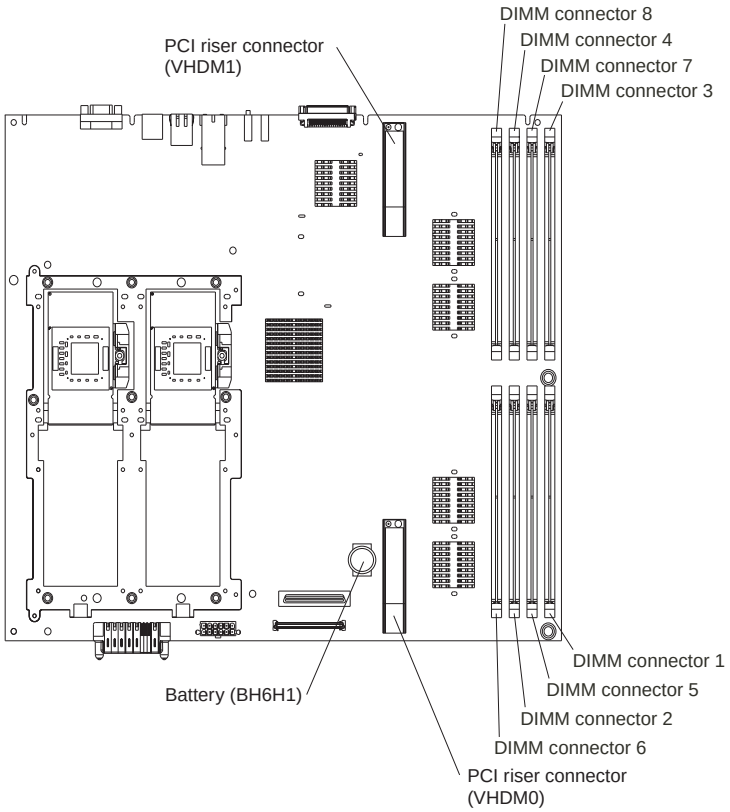
Note: The illustrations in this publication might differ slightly from your hardware.



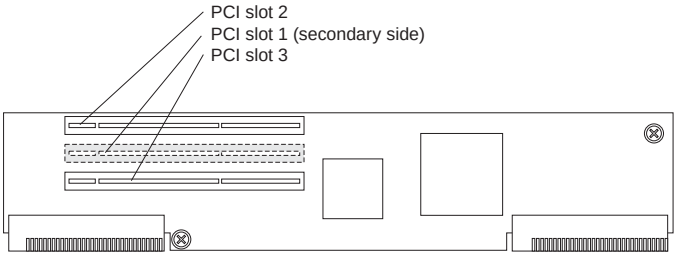
Option connectors

The following illustrations show the connectors for user-installable options.

System-board connectors:



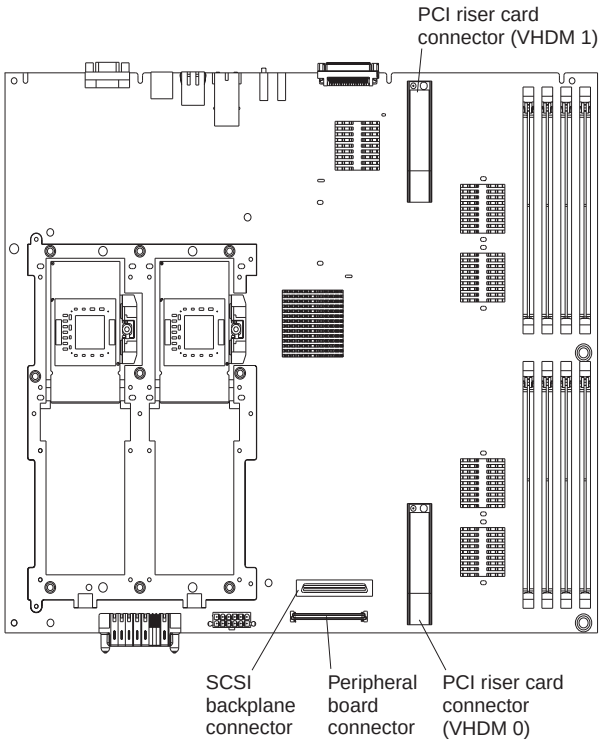
PCI-riser connectors:



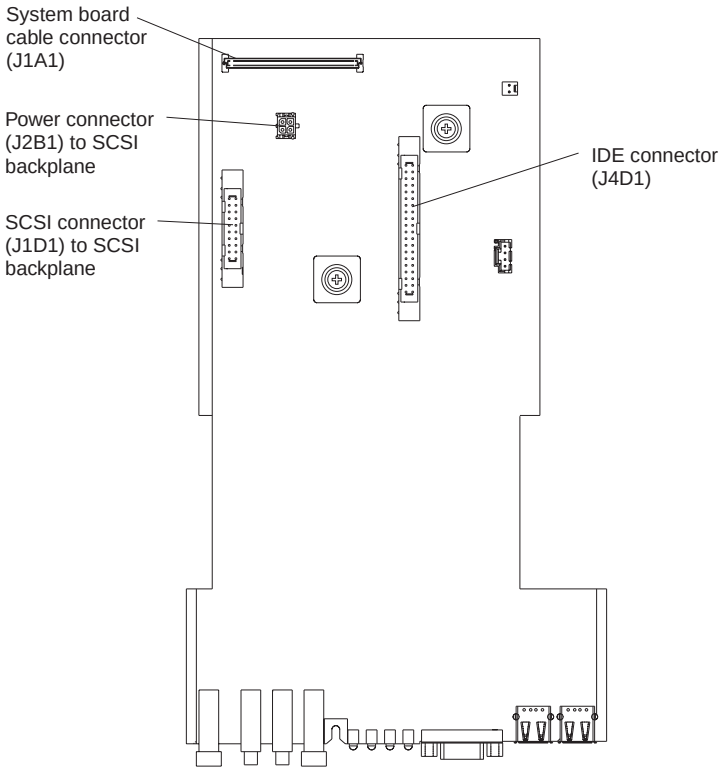
Internal connectors

The following illustration shows the internal connectors of your server.

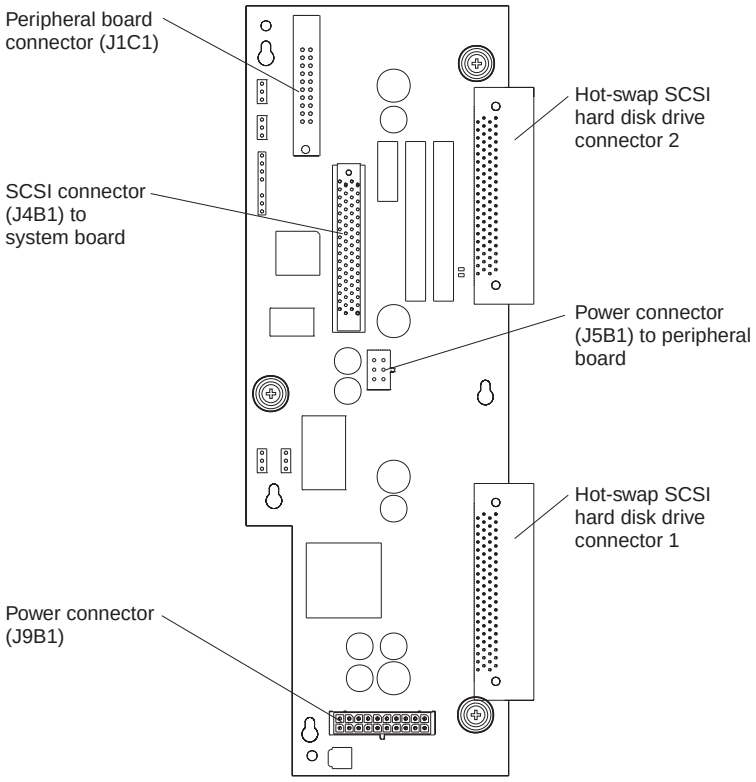
System-board connectors:



Peripheral-board connectors:


System board cable connector (J1A1)
Power connector (J2B1) to SCSI backplane
SCSI connector (J1D1) to SCSI backplane
IDE connector (J4D1)

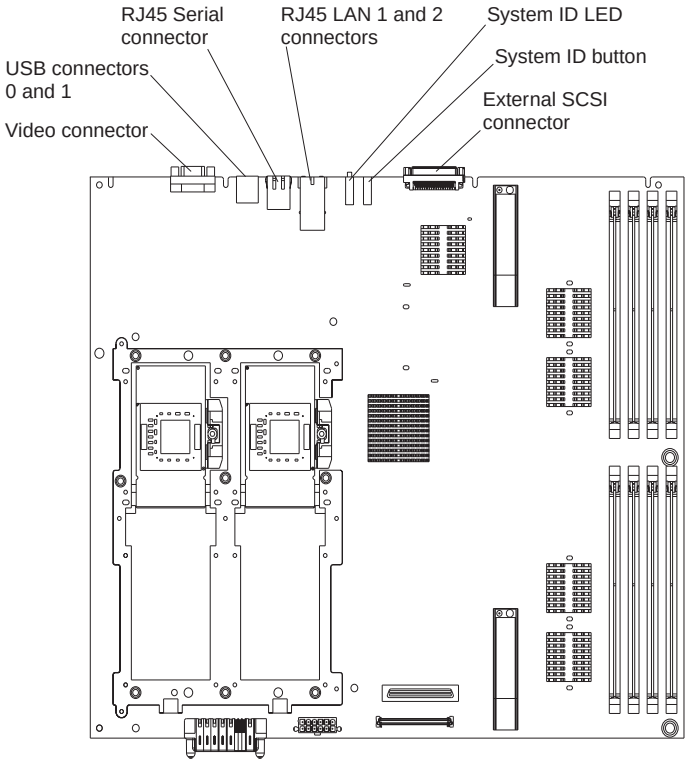
SCSI-backplane connectors:


Peripheral board connector (J1C1)
SCSI connector (J4B1) to system board
Power connector (J9B1)
Hot-swap SCSI hard disk drive connector 2
Power connector (J5B1) to peripheral board
Hot-swap SCSI hard disk drive connector 1

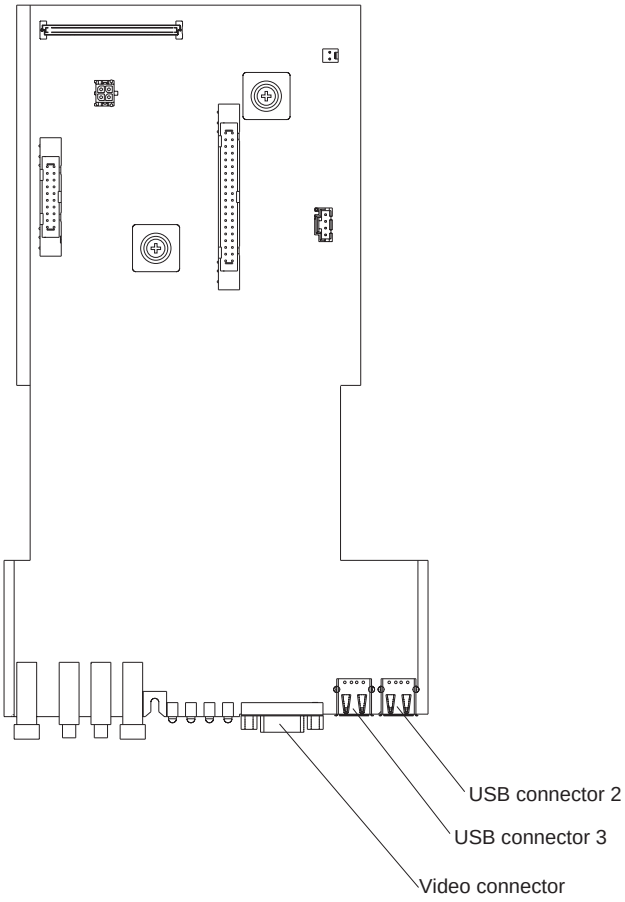
External connectors

The following illustration shows the external input/output port connectors of the server.

System-board connectors:



Peripheral-board connectors:



Chapter 2. Configuring your server

The following configuration programs come with your server:

- **Configuration/Setup Utility**

  This is part of the basic input/output system (BIOS) code in your server. Use it to configure serial port assignments, view system information, change startup options, set the date and time, and set the password. For information about using this utility program, see “Using the Configuration/Setup Utility program”.

- **LSI Logic Configuration Utility**

  Use this to configure the integrated SCSI controller with RAID capabilities and the devices that are attached to it. For information about using this utility program, see “Using the LSI Logic Configuration Utility program” on page 18.

- **ServeRAID Manager**

  ServeRAID Manager is available as a stand-alone program. If a ServeRAID adapter is installed in your server or if you are using the RAID capabilities of the SCSI controller, use ServeRAID Manager to define and configure your disk-array subsystem *before* you install the operating system. For information about using this program, see “Using ServeRAID Manager” on page 19.

- **Ethernet controller configuration**

  For information about configuring the Ethernet controller, see “Configuring the Gigabit Ethernet controller” on page 20.

- **Updating BIOS**

  For information about updating the BIOS for your server, see “Updating BIOS” on page 20.

Using the Configuration/Setup Utility program

The Configuration/Setup Utility program is part of the BIOS code. You can use it to:

- Change the startup options
- Configure serial port assignments
- Set the date and time
- Set the password

Starting the Configuration/Setup Utility program

If your server is already on, shut down the operating system, turn off the server, and wait a few seconds until all in-use lights turn off. Then, restart the server.

The prompt `Hit <F1> if you want to run SETUP` might not be displayed when you start your computer. To start the Configuration/Setup Utility program, turn on the power and immediately press and hold down the F1 key until you see either the Configuration/Setup Utility menu or a password prompt.

If you have not set an administrator password, the Configuration/Setup Utility menu opens on the screen. If you have set a password, the Configuration/Setup Utility menu will not open until you type your password.

After the Configuration/Setup Utility program is started, help information and instructions for using the keyboard are displayed on the right side of the screen.

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Password

From the **System Security** choice, you can set, change, and delete an administrator password. The choice is on the full Configuration/Setup Utility menu only.

An administrator password is intended to be used by a system administrator; it limits access to the full Configuration/Setup Utility menu. If you set an administrator password, you do not have to type a password to complete the system startup, but you must type the administrator password to access the full Configuration/Setup Utility menu. The administrator password can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password.

If you set an administrative password and then forget it, do the following:

1. Turn off the server, disconnect the power cord; then, remove the cover. See “Cover removal and replacement” on page 49.
2. Move the password jumper to the alternate position. To locate the password jumper on the system board, see “System board jumpers” on page 73.
3. Replace the cover, see “Cover removal and replacement” on page 49; then, connect the power cord and turn on the server.

Using the LSI Logic Configuration Utility program

LSI Logic Configuration is a built-in, menu-driven configuration utility program that you can use to:

- Perform a low-level format of a SCSI hard disk drive
- Set a SCSI device scan order
- View or change SCSI IDs for attached devices
- Set SCSI protocol parameters on SCSI hard disk drives

The integrated SCSI controller with RAID capabilities supports redundant array of independent disks (RAID). You can use the LSI Logic Configuration Utility program to configure RAID level 1 for a single pair of attached devices. If you install a different type of RAID adapter, follow the configuration instructions in the documentation that comes with the adapter to view or change SCSI settings for attached devices.

The following sections provide instructions for starting the LSI Logic Configuration Utility program and performing selected functions.

Starting the LSI Logic Configuration Utility program

Complete the following steps to start the LSI Logic Configuration Utility program:

1. Turn on the server.
2. When a list of boot options appears, use the arrow keys to select the EFI shell; then, press Enter.
3. From the Shell prompt, type `devices -b`; then, press Enter.

   A list of devices is displayed, as in the following example:

```
C  T   D
T  Y C I
R  P F A
L  E G G #P #D #C Device Name
== = = = == == == ============================================================
3E D X -  1  1  - LSI Logic Ultra320 SCSI Controller
3F D X -  1  1  - LSI Logic Ultra320 SCSI Controller
```

4. Note the CTRL number given for the integrated LSI Logic Ultra320 SCSI Controller in the displayed list. From the example, the CTRL numbers are 3E and 3F.
5. From the Shell prompt, type `drvcfg`; then, press Enter.

   A list of configurable components is displayed, as in the following example:

   ```
   Configurable Components
     Drv[67]  Ctrl[3E]  Lang[eng]
     Drv[67]  Ctrl[3F]  Lang[eng]
   ```
6. Note the DRV number associated with the CTRL numbers that were noted in step 4. From the example, the DRV number is 67.
7. To start the LSI Configuration Utility At the Shell Prompt type:

   ```
   drvcfg x y -s
   ```

   Where x is the DRV number from step 6 and y is the CTRL number from step 4. From the example, `drvcfg 67 3F -s`.
8. Use the arrow keys to select a controller (channel) from the list of adapters; then, press Enter.
9. Follow the instructions on the screen to change the settings of the selected items; then, press Enter. The **Device Properties** and **Mirroring Properties**, additional screens are displayed.

When you have finished changing settings, press Esc to exit from the program; select **Save** to save the settings that you have changed.

Formatting a SCSI hard disk drive

Low-level formatting removes all data from the hard disk. If there is data you want to save, back up the hard disk before performing this procedure.

Note: Before you format a SCSI hard disk, make sure that it is not part of a mirrored pair. From the list of adapters, select the controller (channel) for the drive to format. Select **Mirroring Properties** and make sure the mirroring value for the drive is set to **None**.

Complete the following steps to format a drive:

1. From the list of adapters, select the controller (channel) for the drive to format.
2. Select **Device Properties**.
3. Use the arrow keys (↑ or ↓) to highlight the drive to format.
4. Use the arrow keys (← or →) or the End key to scroll to the right.
5. Select **Format**; then, press Enter to begin the low-level formatting operation.

Using ServeRAID Manager

You can use the ServeRAID™ Manager program, which are on the *IBM ServeRAID Support* CD and available for download from http://www.ibm.com/pc/support/, to:

- Configure a redundant array of independent disks (RAID)
- Restore a SCSI hard disk drive to factory-default settings, erasing all data from the disk
- View your RAID configuration and associated devices
- Monitor operation of your RAID controllers

You can run ServeRAID Manager in startable-CD mode from the *IBM ServeRAID Support* CD or as an installed program. For information about installing ServeRAID Manager, see the documentation on the CD.

See the ServeRAID documentation on the *IBM ServeRAID Support* CD for additional information about RAID technology and instructions for using ServeRAID Manager. The *Installation Guide* also contains instructions for using ServeRAID Manager to configure your integrated SCSI controller with RAID capabilities.

Notes:

1. The integrated SCSI controller with RAID capabilities in your server supports only RAID level 1.
2. If you install a different type of RAID adapter in your server, use the configuration method described in the instructions that come with that adapter to view or change SCSI settings for attached devices.
3. To update the firmware and BIOS code for an optional ServeRAID controller, you must use the *IBM ServeRAID Support* CD that comes with the ServeRAID option.

Before you install your operating system, you must configure the controller that is attached to the hard disk drives. Use the configuration program on the *IBM ServeRAID Support* CD to configure the integrated SCSI controller with RAID capabilities or to configure an optional IBM ServeRAID controller.

Configuring the Gigabit Ethernet controller

The Ethernet controller is integrated on the system board. It provides an interface for connecting to a 10-Mbps, 100-Mbps, or 1000-Mbps network and provides full duplex (FDX) capability, which enables simultaneous transmission and reception of data on the network. If the Ethernet port in the server supports auto-negotiation, the controller detects the data-transfer rate of the network (10BASE-T, 100BASE-TX, or 1000BASE-T) and automatically operates at that rate, in full-duplex or half-duplex mode, as appropriate.

You do not need to set any jumpers or configure the controller. However, you must install a device driver to enable the operating system to address the controller. The device drivers are available on the *Resource* CD. For the latest device drivers and information about configuring your Ethernet controller, go to the IBM Support Web site at http://www.ibm.com/pc/support.

Updating BIOS

Go to the IBM Support Web site, http://www.ibm.com/pc/support for the latest information about upgrading the BIOS for your server. The latest instructions are in the documentation that comes with the update.

Note: After you complete the BIOS update, the old CMOS settings must be cleared by a qualified service technician.

Chapter 3. Diagnostics

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your server.

If you cannot locate and correct the problem using the information in this section, see Appendix A, “Getting help and technical assistance”, on page 93 for more information.

General checkout

The EFI platform diagnostic tests allow you to quickly assess the server’s hardware status, view test logs, and determine the server’s current configuration. You can run the diagnostic tests from within the EFI environment.

If you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic tests to confirm that the hardware is working properly.

When you run the diagnostic tests, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

Notes:

1. If multiple error codes are displayed, diagnose the first error code that is displayed.
2. If the server stops with a POST error, go to “Error codes - video display” on page 81.
3. If the server stops and no error is displayed, go to “Undetermined problems” on page 88.
4. For safety information, see “Safety information” on page 95.
5. For intermittent problems, check the test log. See “Viewing the test log” on page 38
6. If device errors occur, see “Error symptoms” on page 86.
7. For power supply LED errors, see “Power supply LED errors” on page 87.
8. If the BIOS is corrupted, go to “BIOS recovery mode” on page 42
9. If you cannot find the problem in the error symptom charts, go to “EFI-based SELViewer task” on page 23 to test the server.

001 **USE THE FOLLOWING PROCEDURE TO CHECKOUT THE SERVER.**

1. Turn off the server and all external devices, if attached.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Turn on all external devices.
5. Turn on the server.
6. Record any beep codes that you hear prior to video initialization, see “Beep codes” on page 79.
7. Record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error, see “Error codes - video display” on page 81

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8. Check the test log, see “Viewing the test log” on page 38. If an error was recorded in the test log, go to Chapter 6, “Symptom-to-FRU index”, on page 79.
9. Check for the following responses:
   - One beep.
   - Readable instructions or the main menu.

002 **DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?**

NO. Find the failure symptom in Chapter 6, “Symptom-to-FRU index”, on page 79.

YES. Run the diagnostic tests. If necessary, see

- “Running system diagnostics” on page 37.
- “Setting test options” on page 38.
- “Interpreting test results” on page 38.
- “Getting help on individual tests” on page 38.

If you receive an error, see Chapter 6, “Symptom-to-FRU index”, on page 79.

If the diagnostic tests were completed successfully and you still suspect a problem, see “Undetermined problems” on page 88.

SEL overview

The System Event Log (SEL) is a non-volatile repository for event messages. Event messages contain information about system events and anomalies that occur on the server, BIOS, and event generators. System sensors can also trigger events that are logged in the SEL.

Some event messages are the result of normal events, such as a normal server boot, or possible minor problems such as a disconnected keyboard. Other events may indicate internal failures such as a component over-temp condition where thresholds, or ranges of acceptable values have been exceeded. As with other system events, if at any time a component crosses one of these defined thresholds, an event message will be generated.

Regardless of the event, the appropriate management controller generates an event message. Event messages are passed to the Baseboard Management Controller (BMC). The BMC passes the event message to the SEL where it becomes available for querying by the SEL Viewer utility.

The SEL Viewer provides an interface for the server administrator to view information in the SEL. The SEL Viewer is available through the EFI based SEL Viewer utility which is available in the System Management Utility (SMU) that ships on the standard platform resource CD. The system administrator can use this information to monitor the server for warnings and potential critical problems.

EFI-based SELViewer task

The EFI based SEL Viewer task is available on the System Maintenance Utility (SMU). This task will not be available when running the Remote version. The EFI SEL Viewer provides support for the user to perform the following:

- Examine all SEL entries stored in the non-volatile storage area of the server in text form or in hexadecimal.
- Examine previously stored SEL entries from a file in text form or in hexadecimal.
- Save the SEL entries to a file.
- Clear the SEL entries from the non-volatile storage area.
- Sort the SEL records by various fields such as timestamp, sensor type number, event description, and generator ID.
- Five columns of SEL data can be viewed from the EFI SEL Viewer Utility:
  - Number of Event
  - Time Stamp
  - Sensor Type and Number
  - Event Description
  - Generator ID

xSeries 382 SEL data tables

The following tables contain information on the data provided by the SEL Viewer utility.

Table 2. xSeries 382 generator ID codes

Generator ID	Generator
20 00	BMC
C0 00	HSC
0x31 00 -0x3F 00	System BIOS or System SW

Table 3. Sensor types, numbers and names

Sensor Type	Sensor Number	Sensor Name
01 (temperature)	20h	Memory board temperature
01 (temperature)	21H	Memory board SNC temperature
01 (temperature)	22h	PCI riser SIOH temperature
01 (temperature)	23h	Peripheral board AMB temperature
01 (temperature)	24h	PCI riser board temperature
01 (temperature)	25h	CPU area temperature
01 (temperature)	26h	Memory area temperature
01 (temperature)	81hp	Microprocessor 1temperature
01 (temperature)	82hp	Microprocessor 2 temperature
02 (voltage)	10h	System board +1.25V
02 (voltage)	11h	System board +1.5V
02 (voltage)	12h	System board +1.8V
02 (voltage)	13h	System board +3.3V

Table 3. Sensor types, numbers and names (continued)

Sensor Type	Sensor Number	Sensor Name
02 (voltage)	14h	System board +3.3V SB
02 (voltage)	15h	System board +5V
02 (voltage)	16h	System board +12V
02 (voltage)	17h	System board -12V
02 (voltage)	18h	System board +1.2V
02 (voltage)	19h	System board +1.3V
02 (voltage)	1Ah	System board -1.5V SB
02 (voltage)	1Bh	System board +2.5V
02 (voltage)	1Ch	System board +2.5V SB
02 (voltage)	1Dh	System board 2 +5V SB
02 (voltage)	50h	LVDS SCSI channel 1 terminator 1
02 (voltage)	51h	LVDS SCSI channel 1 terminator 2
02 (voltage)	52h	LVDS SCSI channel 1 terminator 3
02 (voltage)	53h	LVDS SCSI channel 2 terminator 1
02 (voltage)	54h	LVDS SCSI channel 2 terminator 2
02 (voltage)	55h	LVDS SCSI channel 2 terminator 3
02 (voltage)	86h	Microprocessor 1 Power Pod Good
02 (voltage)	87h	Microprocessor 2 Power Pod Good
04 (fan)	30h	Tach fan 1
04 (fan)	31h	Tach fan 2
04 (fan)	32h	Tach fan 3
04 (fan)	33h	Tach fan 4
04 (fan)	34h	Tach fan 5
04 (fan)	35h	Tach fan 6
04 (fan)	70h	Fan 1 present
04 (fan)	71h	Fan 1 present
04 (fan)	72h	Fan 1 present
04 (fan)	73h	Fan 1 present
04 (fan)	74h	Fan 1 present
04 (fan)	75h	Fan 1 present
05 (Physical security	05h	LAN leash lost
06 (Security violation attempt)	04h	Platform security violation
07 (microprocessor)	80h	Microprocessor 1 status
07 (microprocessor)	81h	Microprocessor 2 status
08 (power supply)	60h	Power supply 1
08 (power supply)	61h	Power supply 2
08 (power supply)	62h	Power supply 3
09 (power unit)	01h	Power unit status
09 (power unit)	02h	Power unit redundancy

Table 3. Sensor types, numbers and names (continued)

Sensor Type	Sensor Number	Sensor Name
0D (Hot-swap drive sensors)	01h	SCSI backplane temperature
0D (Hot-swap drive sensors)	02h	Hot-swap drive 1 status
0D (Hot-swap drive sensors)	03h	Hot-swap drive 2 status
0D (Hot-swap drive sensors)	05h	Hot-swap drive 1 present
0D (Hot-swap drive sensors)	06h	Hot-swap drive 2 present
0F (POST error)	06h	POST error
10 (event logging)	09h	Event logging disabled
12 (system event)	12h	OEM system boot event PEF action
13 (critical interrupt)	07h	FP Diag Interrupt (Front Panel SD Init)
15 (module / board)	77h	System board interlock
23 (watchdog)	03h	BMC watchdog 2
C7(OEM)	40h	Fan Boost Mem Board Temp
C (OEM)	41h	Fan Boost Mem Board SNC Temp
C7 (OEM)	42h	Fan Boost PCI Riser SIOH Temp
C7 (OEM)	43h	Fan Boost Peripheral Board AMB Temp
C7 (OEM)	44h	Fan Boost PCI Riser Board Temp
C7 (OEM)	45h	Fan Boost CPU Area Temp
C7 (OEM)	46h	Fan Boost Mem Area Temp
C7 (OEM)	84h	Fan Boost microprocessor 1 Temp
C7 (OEM)	85h	Fan Boost microprocessor 2 Temp

xSeries 382 machine check error handling

This section gives an overview of the implementation of machine check error handling on the xSeries 382 server system. For additional details about Itanium-based system error generation and error handling, refer to the Itanium Processor Family Error Handling Guide (document number: 249278-002) and the Itanium System Abstraction Layer Specification (document number: 245359-005). Both documents can be downloaded from the web at http://developer.intel.com.

The goal of MCA is to contain errors and correct as many as possible before they propagate to network or permanent storage. If an error cannot be fixed by the hardware or firmware, and the OS cannot handle it, the machine shall be reset. MCA errors include ECC, BINIT, BERR, SERR, and PERR. These conditions are handled by the BIOS through SAL 3.0-compatible services.

Classification of errors

Error events are classified by the processor and platform into three basic groups. This section provides a summary of the different error types and signaling methods defined by the Itanium Machine Check Architecture (MCA) and implemented in the xSeries 382 platform.

Error types

There are three types of errors:

Fatal error

A fatal error is an error where the state has been corrupted and the error may, or may not, be contained. The platform will signal a fatal error when the integrity of the platform or subsystem cannot be determined. These errors cannot be corrected by hardware, firmware, or system software. A reset of the system or subsystem is required.

Recoverable/uncorrectable error

An error has been detected that cannot be corrected by hardware or firmware. However, the operating integrity of platform hardware and system state has been maintained. These errors may or may not be recoverable (determined by system software capabilities).

Correctable error

An error has been detected and corrected by the hardware, or by processor/platform firmware.

Error signaling

There are two classes of error events:

Machine check error events

A processor machine check occurs when the processor detects a fatal or recoverable error during execution of instructions or when the processor is signaled by the platform to enter machine check.

Machine Check Architecture (MCA)

The MCA can be either local or global. In the event of an MCA, the processor will take the exception at instruction boundary with highest priority. In the event of a local abort, the affected processor will enter MCA handling mode. If the event is global, all processors will enter MCA handling mode.

- Uncorrectable Error Events:

  Local MCIA

  A local MCA is taken by the processor when it reads data with uncorrectable errors, or receives a hard fail response to a transaction. There are two types of machine check events: local and global. A local MCA is when an individual processor enters machine check. Some examples of local machine checks include a Distributed Translation Lookaside Buffer (DTLB) data parity error, or when the processor consumes data with an uncorrectable error.

  Global MCA

  A machine check is global when all processors enter machine check. On the xSeries 382 platform, the method used to get all processors into machine check are the BINIT# and BERR# signals. The processor asserts BINIT#, or there is an assertion of BERR# by the processor or platform. The processor can assert BINIT# on a transaction time-out event. BERR# is asserted by the platform on platform-fatal errors, and can be programmed to assert BERR# when an uncorrectable error is detected on I/O read data.

- Correctable Error Events

  Corrected Machine Check (CMC)

  Corrected processor errors are signaled as a CMCI to system software.

For example, L1 tag parity errors, on shared lines or thermal events, are corrected by the processor (logic or the PAL). System software must insure that the interrupt handler for CMCI executes on the same processor that signaled the corrected error event.

Corrected Platform Errors (CPE)
These interrupts are signaled by the platform or the SAL. These include errors that are corrected by the platform (such as single-bit ECC error in memory) and errors that are not correctable by the platform. In either case, the error is contained (i.e., data poisoning), and the platform can still function reliably. One example of an uncorrected error is a 2XECC error detected on a write to memory.

Error reporting

xSeries 382 machine check error handling allows enhanced error reporting of processor and platform errors. These errors are prioritized and signaled to system hardware and software. System software (PAL/SAL) provides well-defined APIs for application software to acquire information about system errors in the form of standard data structures. These errors are logged to non-volatile storage and/or made available for consumption by application software during runtime. These errors are in the MCA records and they are based on the Itanium System Abstraction Layer Specification Rev 3.0.

On the xSeries 382, based on the MCA records, system events related to Field Replaceable Units (FRUs) are logged in the BMC SEL. Each MCA record results in the generation of one or more corresponding BMC SEL event(s). In addition, an auxiliary log entry event will be logged corresponding to each MCA record. The SEL messages are IPMI 1.5-compliant platform event messages. All MCAs are logged into NVRAM and the SEL.

The format of the SEL entries is compliant with the IPMI 1.5 specification. The BIOS will log system events and POST error codes. The BIOS will log a boot event to BMC at the end of the POST just before loading EFI. The events logged by the BIOS will follow the IPMI specification.

The following rules are applied to the translation of SAL 3.0 MCA records to IPMI 1.5-compliant platform event messages.

Table 4. SAL 3.0 MCA record event messages

MCA SAL record section type.	**SEL event: Sensor type.**	**SEL event: Event data bytes.**
Microprocessor.	Microprocessor IERR.	SMBIOS type 4 0-based index. Error severity.
PCI bus PERR/SERR.	Critical interrupt. PERR. SERR.	PCI bus number.
PCI bus other.	Critical interrupt. Bus correctable. error. Bus uncorrectable. error.	None .

Table 4. SAL 3.0 MCA record event messages (continued)

MCA SAL record section type.	SEL event: Sensor type.	SEL event: Event data bytes.
PCI components.	Critical interrupt. PERR. SERR.	PCI, bus, device, function information.
Memory device.	Memory error. Correctable. Uncorrectable.	SMBIOS type 16 0-based index.
Other.	Critical interrupt. Bus correctable error. Bus uncorrectable error.	None

Thresholding

MCA errors are classified into one of three categories: corrected, recoverable, and fatal. In general, corrected errors will not affect the operation of the system and therefore may occur repeatedly (fatal and most recoverable errors result in a system reset.) In some cases, such as a stuck bit in a memory DIMM, a corrected error may occur with a very high frequency. In this scenario, the system may experience performance degradation due to excessive amounts of time spent in the error logging routines. In addition, the BMC SEL has a finite size and may be quickly filled with duplicate errors. To help alleviate these problems, a thresholding algorithm has been applied to the BMC SEL logging routines. If the threshold is crossed, a special ″event disabled″ SEL entry will be created and the BMC SEL logging code will not attempt to send future platform event message commands for that error type to the BMC.

This greatly reduces the amount of time spent in the SEL logging routines and avoids overrunning the BMC SEL log storage. This thresholding in no way affects the ability of the OS to receive notification and service CPEIs or CMCIs, nor does it disable any error correction logic in the chipset. Any disabled event reporting will be re-enabled on the next reboot.

Corrected errors are grouped into four categories: Microprocessor, Memory, PCI PERR, and Generic Bus. History for each category is maintained separately. Thresholding does not apply to Recoverable or Fatal errors, only corrected errors. On the xSeries 382, the maximum number of errors that can occur for each category is “10”, within one hour. If this threshold is crossed, a special ’Event Logging Disabled’ SEL entry will be logged.

SEL event log format for machine check errors

The following tables shows the machine check errors that will be logged for the xSeries 382, and the corresponding SEL Event Log format. For details on System Management BIOS (SMBIOS) Type 4, Type 16 and 17, refer to the System Management BIOS Reference Specification available on http://www.dmtf.org.

Table 5. Microprocessor errors

Processor error type	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
Fatal	0x31	0x4	0x7	N/A	0x6F	0xA0	Index to SMBIOS type 4 record	Severity 0x01
Un-correctable	0x31	0x4	0x7	N/A	0x6F	0xA0	Index to SMBIOS type 4 record	Severity 0x00
Correctable	0x31	0x4	0x7	N/A	0x6F	0xA0	Index to SMBIOS type 4 record	Severity 0x02

Table 6. Memory DIMM errors

Processor error type	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
Un-correctable	0x33	0x4	0xC	N/A	0x6F	0x81	0xFF	Bit 7:6 Index to SMBIOS type 16 record. Bit 5:0 Index to SMBIOS type 17 record.
Correctable	0x33	0x4	0xC	N/A	0x6F	0x81	0xFF	Bit 7:6 Index to SMBIOS type 16 record. Bit 5:0 Index to SMBIOS type 17 record.

Table 7. PCI device errors

PCI device error type	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
PERR	0x31	0x4	0x13	N/A	0x6F	0xA4	PCI bus number	Bit 7:3 DEV number Bit 2:0 Func number
SERR	0x31	0x4	0x13	N/A	0x6F	0xA5	PCI bus number	Bit 7:3 DEV number Bit 2:0 Func number

Table 8. PCI bus errors

PCI bus error type	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
PERR	0x31	0x4	0x13	N/A	0x6F	0x84	PCI bus number	0xFF
SERR	0x31	0x4	0x13	N/A	0x6F	0x85	PCI bus number	0xFF

Table 9. Microprocessor bus, LPC bus, SP prot, HL bus, non-specific bus errors

Processor bus, LPC bus, SP port, HL bus, non-specific bus errors	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
Un-correctable	0x31	0x4	0x13	N/A	0x6F	0x08	0xFF	0xFF
Correctable	0x31	0x4	0x13	N/A	0x6F	0x07	0xFF	0xFF
Event logging disabled (Thres-holding)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SEB memory logging disabled	0x31	0x4	0x10	N/A	6x6F	0x00	0xFF	0xFF
Bus correctable logging disabled	0x31	0x4	0x10	N/A	0x6F	0xF1	0x13	0x27

Table 9. Microprocessor bus, LPC bus, SP prot, HL bus, non-specific bus errors (continued)

Processor bus, LPC bus, SP port, HL bus, non-specific bus errors	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
Processor correctable logging disabled	0x31	0x4	0x10	N/A	06xF	0xF1	0x07	0x20
PCI PERR logging	0x31	0x4	0x10	N/A	0x6F	0xF1	0x13	0x24
Disabled	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 10. System event (MCA event indicator)

System event (MCA indicator)	Gen ID	EvMRev	Sensor type	Sensor number	Ev directory / type	Data 1	Data 2	Data 3
Aux log entry	0x31	0x4	0x12	N/A	0x6F	0xC3	0x20	0xFF
Aux log entry	0x31	0x4	0x12	N/A	0x6F	0xC3	0x00	0xFF

xSeries 382 PCI device IDs

The xSeries 382 server has the following PCI devices and slots on the I/O board:

Table 11. Onboard PCI devices and slots

Device Description	PCI bus	Bus number	Device ID	Function number
SNC	FSB	0xFF	0x18	0,1,2
SIOH	SNC	0xFF	0x1C	N/A
DH	SNC	0xFF	0x018	1
ICH4	Internal	0	30	0
LPC	N/A	0	31	0
IDE controller	N/A	0	31	1
USB controller 1 (1.1)	N/A	0	29	0
USB controller 2 (1.1)	N/A	0	29	1
Video	Internal	0	N/A	N/A
Dual GB NIC	A (embedded)	Dynamic	1	0,1
SCSI controller	B (embedded)	Dynamic	1	0,1
PCI slot 1	A (133MHz full-size)	Dynamic	1	N/A

Table 11. Onboard PCI devices and slots (continued)

Device Description	PCI bus	Bus number	Device ID	Function number
PCI slot 2	A (100MHz full-size)	Dynamic	1	N/A
PCI slot 2	A (100MHz full-size)	Dynamic	2	N/A

POST error codes and messages

The POST error codes messages are displayed on the video screen and logged in the SEL.

There are two error code classifications:

Red Critical events that require user interaction. BIOS POST will pause with a message requesting to Press F1, F2, or ESC. The server will pause on boot.

Yellow
Non-critical events. BIOS POST will continue after a brief pause and does not require user interaction. The server will not pause on boot.

For a detailed list of POST codes and messages, see “Beep codes” on page 79 and “Error codes - video display” on page 81.

Debug methodology and FRU isolation

Memory

If the memory test finds any bad DIMM(s) (defined as mismatched DIMMs within a row, multi-bit errors [MBE] detected within a DIMM, single-bit [SBE] non-transient errors within a DIMM), the entire associated row will be mapped out and autoscan will not include any memory that is mapped out. The memory test can isolate persistent or non-transient single-bit and multi-bit errors to the defective DIMM and will make that information available.

Note: This server uses 4-way interleaved memory. A row is defined as a set of four identical type and size DIMMs.

If mismatched or bad DIMMs are found during the initial geometry check, the bad row will be logged to the System Event Log (SEL). If both rows are determined to be bad, the system will not boot, and the bad row(s) will be logged to SEL. Additionally, the system will emit beep codes as documented in the post and error codes section.

Assuming that there is at least one good row, the bad row will be reported as an error when video is available will be logged to the SEL, and the system will continue to boot.

Memory Debug Methodology

Remove memory DIMM, look for bent pins or obvious sign of contamination on DIMM or inside DIMM site - Reseat the memory; swap ROW one with ROW two (2nd set of 4 DIMMS) reconfigure to minimum memory configuration (4 DIMMs in one ROW, DIMM sites 1,2,3,4 must be populated at a minimum).

Note: Even though DIMMs are numbered and populated consecutively, DIMM Sites are not physically consecutive. Refer to the silk-screen on the system board near each DIMM site - first 4 DIMMS in order below.

DIMM Sites 1=J9J3, 2=J9J1, 3=J9D3, 4=J9D1 FIRST. Sites 5=J9J2, 6=J8J1, 7=J9J2, 8=J8D1 are optional.

Exchange the memory, one ROW at a time, with a complete set of known good memory. If failure symptoms persist, suspect the motherboard. If it passes, replace the suspect memory, one at a time, into their original sockets, until the Failure recurs. If replaced one by one, FRU P/Ns must be the same.

Memory FRU isolation

DDR 266 Memory can be replaced, one by one, with same mfg. P/N (same size, die, and vendor) A complete row must be replaced in sets of 4 (minimum config is 4 x 256= 1GB). Populate DIMM Sites 1=J9J3, 2=J9J1, 3=J9D3, 4=J9D1 FIRST. Sites 5=J9J2, 6=J8J1, 7=J9J2, 8=J8D1 are optional. If failure persists replace system board.

Microprocessor debug methodology:

1. Enter Setup and select startup options: then, select processor retest. Save Setup: then, press F10 to exit setup.
2. Run Platform Diagnostic test (located on Resource CD); if error persists perform the following checks and steps:
   a. Turn off the server and disconnect the ac power cord. Remove the top cover and microprocessor air duct.
   b. Reseat DC harness to power pod. Check to see that processor is locked (locking flag or tab on the side of processor socket is visible).
   c. Check to see that the processor screws (4) are tightened to 6-inch pounds (Use T-15 Torx - do not over tighten). If tab is not visible, loosen the (4) captive mounting screws and lock the processor (if tab is visible = locked, use 2.5mm Allen clockwise 1/4 turn to lock) tighten the (4) mounting screws replace covers, reconnect AC source, re-boot / re- run test.

If failure symptom persists:

1. Turn off the server and disconnect the power cord; Then, remove the top cover and processor air duct.
2. If the server video display remains blank listen for error beep codes. If you hear a beep code, go to “Beep codes” on page 79.
3. Remove DC power harness from power pod, remove power pod (loosen 4 captive screws / slide pod away from processor to disengage).
4. Remove DC power harness from power pod, remove power pod (loosen 4 captive screws / slide pod away from processor to disengage).
5. Remove DC power harness from power pod, remove power pod (loosen 4 captive screws / slide pod away from processor to disengage).
6. Remove and inspect pins on processor (loosen 4 captive screws on processor, turn lock tab counterclockwise 1/4 turn, “tab not visible”, lift processor to disengage).
7. Reseat processor & power pod (repeat above steps in reverse order) and re-run tests.
8. Replace / swap power pods or BSP (1st) with APP (2nd) processor.
9. Replace covers, reconnect AC source, restart system.

10. Run the test in single processor mode (socket 1 must be populated to boot, socket 2 will auto terminate).

Microprocessor FRU isolation

If after reseating or swapping component positions, the suspect component cannot be located (i.e. DC harness, power pod or processor) and the failure persists, replace the system board.

Microprocessor - Late Self-test

The processor late self-test helps BIOS to determine whether the processors present in the system are healthy enough to boot and run the OS. Once the system memory is initialized, BIOS SAL calls PAL to perform “late self test” on the processor(s) present in the system. The possible late self-test results for each processor are:

- Performance restricted - machine will continue through POST until the sign-on banner and memory test results are displayed. At this time the late self-test will display a message as documented in the next section.
- Functionally restricted - machine will continue through POST until the sign-on banner and memory test results are displayed. At this time the late self-test will display a message as documented in the next section.
- Catastrophic failure - Itanium 2 processor does not return from PAL in this failure case. The BIOS assumes this as the last condition after eliminating other possibilities (in the order Healthy, Functionally, Performance Restricted). Refer to “Debug methodology and FRU isolation” on page 32.
- Healthy - If the late self test result is healthy, the system continues the boot as expected and no messages are displayed.

It is at the point of displaying the late self-test errors that any errors encountered are logged to SEL. This is done because the BIOS will have to reset the system early in POST, well before the POST error manager is called, in order to selectively take a failed processor off-line.

Late self-test display

Immediately after the BIOS sign-on banner information is displayed, if any processor late self- test error is encountered, the BIOS displays the following message:

Errors found in the processor late self-test. Please wait while the failed processor is disabled for the next boot. System will reset automatically. After this message is displayed, the system will be reset.

Late self-test usage notes

Because the late self-test relies on encapsulated PAL code, there are certain conditions under which the test will operate. These are listed below.

- Only one processor will be disabled per boot cycle.
- On the next boot, the unhealthy processor is not included in the system boot.
- If errors occur during any processor late self-test, the POST error manager will not be displayed on the boot cycle in which the error is detected.

- The POST error manager will only display the fact that a processor is disabled and this will occur on the boot cycle after the processor is disabled. In order to determine if the processor is disabled because of late self-test errors, the SEL will have to be referenced.

Watch dog timer

The BIOS Setup offers a control item that allows the OS load watchdog timer to be enabled or disabled. The default for the OS load watchdog timer function is disabled. The server BIOS will support the OS load watchdog timer. This may also be referred to as FRB-4, although the term “OS load watchdog timer” is more accurate, as this timer has no FRB-related connection to disabling processors.

Watch dog timer debug methodology:

The Watchdog Timer can be enabled / modified in system setup (Enter Setup / startup options) this menu item is also located under the System Management Submenu - Platform Event Filters (PEF). The watchdog timer provides a ’timer use’ field that indicates the current use assigned to the watchdog timer. If enabled and depending on selections configured the timer allows the user to:

- Log an event to SEL upon expiration of the OS load watchdog timer.
- Select the timeout action to be hard reset, and pre-timeout interrupt type to none.
- Set the pre-timeout interval to zero; the pre-timeout action occurs concurrently with the timeout action.
- Program the countdown value to selectable seconds.

Fault resilient boot (FRB)

The BIOS and BMC firmware provide a feature to guarantee that the system boots, even if one or more processors fails during POST. The BMC contains two FRB timers that can be configured to reset the system upon time out.

FRB3 - BSP reset failures

The first timer (FRB-3) starts counting down when the system comes out of hard reset. If the bootstrap microprocessor (BSP) successfully resets and begins executing, the BIOS disables the FRB-3 timer in the BMC and the system continues executing POST. If the timer expires because of the BSP failure to fetch or execute BIOS code, the BMC resets the system and disables the failed processor. In this failing scenario, the BMC continues to change the BSP until the BIOS successfully disables the FRB-3 timer. The BMC sounds beep codes on the system speaker if it fails to find a good processor. It will continue to cycle until it finds a good processor. The process of cycling through all the processors is repeated upon system reset or power cycle. The duration of the FRB-3 timer is 6 minutes.

FRB2 - BSP POST failures.

The second timer (FRB-2) is set for approximately 6 minutes (pending tuning) by BIOS and is designed to guarantee that the system completes POST. The FRB-2 timer is enabled just before the FRB-3 timer is disabled to prevent any “unprotected” window of time. Before the option ROMs are initialized, or if the password prompt is displayed, the BIOS disables the FRB-2 timer. Finally, if the system is set to perform a processor late self-test, the FRB-2 timer will be suspended.

If the system hangs during POST, before the BIOS disables the FRB-2 timer, the BMC generates an asynchronous system reset (ASR). The BMC retains status bits that can be read by BIOS later in the POST for the purpose of disabling the

previously failing processor, logging the appropriate event into the SEL, and displaying an appropriate error message to the user.

FRB1 - BSP self-test failures.

In addition to FRB-3 and FRB-2 timers, the BIOS provides FRB-1. Early in POST, the BIOS checks the Built-in Self Test (BIST) results of the BSP. If the BSP fails BIST, the BIOS requests the BMC to disable the BSP. The BMC disables the BSP, selects a new BSP and generates a system reset. If there is no alternate processor available, the BMC beeps the system speaker and enters into “final desperation mode”, a scheme whereby the system will attempt to boot in spite of failed processors.

The BIOS and BMC implement additional safeguards to detect and disable the application processors (AP) in a multiprocessor system. If an AP fails to complete initialization within a certain time, it is assumed to be nonfunctional. If the BIOS detects that an AP has failed BIST or is nonfunctional, it requests the BMC to disable that processor. When the BMC disables the processor and generates a system reset, the BIOS will not see the bad processor in the next boot cycle. The failing AP is not listed in ACPI APIC tables, and is invisible to the OS.

FRB debug methodology:

All the failures (FRB-3, FRB-2, FRB-1, and AP failures) including the failing processor are recorded into the SEL. The FRB-3 failure is recorded automatically by the BMC, while the FRB-2, FRB-1, and AP failures are logged to the SEL by the BIOS. In the case of an FRB-2 failure, some systems will log additional information into the OEM data byte fields of the SEL entry. This additional data indicates the last POST task that was executed before the FRB-2 timer expired. This information may be useful for failure analysis.

The BIOS and BMC maintain failure history for each processor in nonvolatile storage. This history is used to store a processor’s track record. Once a processor is marked “failed,” it remains “failed” until the user forces the system to retest the processor by entering BIOS Setup and selecting the “Retest processors” option. The BIOS reminds the user about a previous processor failure during each boot cycle until all processors have been retested and successfully passed the FRB tests or AP initialization.

It is possible for all the processors in the system to be marked bad. If all the processors are bad, the system, in final desperation mode, does not alter the BSP and attempts to boot from the original BSP. Again, error messages are displayed on the console and errors are logged in the SEL against a failing or non-healthy processor, with the exception of the single processor case, where the error will be logged, but failing desperation mode, there will be no video display.

If the user replaces a processor that has been marked bad by the system, the system must be informed about this change by running BIOS Setup and selecting the processor retest option.

User selection of the retest microprocessor option, in BIOS Setup, results in the BIOS and BMC clearing the microprocessor failure history from their respective non-volatile storage.

There are three possible states for each processor slot:

- Microprocessor installed (status only; indicates processor has passed BIOS POST).

- Microprocessor failed. The processor may have failed FRB-2, FRB-3, or BIST, and it has been disabled.
- Microprocessor not installed (status only, indicates the processor slot has no processor in it).

FRB FRU isolation

The issue may be caused by add-in adapter resource contention causing the timer to expire and trigger an FRB, the system should be brought to a minimum config to eliminate variables and restarted w/processor re-test (Enter BIOS / startup options). If the failure persists Refer to “Processor” in Debug Methodology and FRU Isolation section.

POST codes

In order to indicate progress through BIOS POST, and in special cases where errors are encountered during BIOS POST, there are two common mechanisms which are employed by the xSeries 382 BIOS.

- The first and most common method is Audible, encoded beep sequences emitted by the PC speaker when an error is encountered. Beep codes are employed before the display screen is enabled, and generally indicate fatal errors. Beep codes are coupled with special port 80 error codes.
- The second method is to display an error message to the display screen after the Video has been initialized.

Beep Codes

During the course of executing POST, there are occasions where fatal problems may occur before video is enabled. These fatal errors are conveyed with the use of the speaker via Encoded beeps, coupled with post debug codes.

Since the duration of the display-less POST execution is relatively short, there are fewer beep codes than displayed error codes.

Running system diagnostics

Follow these steps to run your system diagnostics from the *XSeries 382 Resource CD*:

Note: The system diagnostics may also be run from an installed service partition. See Installing service partition files on page 43.

1. Insert the xSeries 382 Resource CD into the server’s CD-ROM drive before booting to the EFI Shell. Boot the system into the EFI Shell, the EFI CD Menu program launches automatically. If the EFI CD Menu program does not launch in the EFI Shell, mount and map to the CD drive and type startup; then, press Enter to launch the EFI CD Menu.
2. From the menu tab, use the arrow keys to navigate over to the Utility menu and press Enter or the down arrow to expand the menu.
3. From the Utility menu, arrow down to Platform Diagnostics and press Enter to launch the Diagnostic Menu.

To run one or more of the diagnostic tests, select Test setup from the Platform test menu. Use the up and down arrows to first select a test, and then press Q for a quick test, C for a complete test, or D to disable the test. When a test is enabled, the word “Quick” or “Complete” appears next to the test under the “Coverage”

column. If a test is disabled, the word “Disabled” appears under that column. An individual test may be executed up to nine times for each run of the test suite. With the test highlighted, pressing a single digit 1 - 9 on the keyboard sets the number of iterations for an individual test.

Note: The diagnostic tests can be found on the xSeries 382 Resource CD or on the EFI service partition, see “EFI service partition” on page 39.

Because of space limitations, the test area of the screen displays only six tests at a time. Using the arrow keys causes the test display to scroll completely through the list.

Note: By default on startup all tests are set to “Quick” test and single iteration. You may go directly to “Run Test” if no changes are required.

Setting test options

The Test options pull down opens the Test Options window. In the Test Options window you may determine if the test stops on one of two parameters; time or iterations. By navigating to the “Stop On” item in the window and hitting the Enter key you are given the options of “Iterations” or “Minutes”. If Iterations is set, the testing stops after executing the full test suite, however many times is indicated by the number in the “Iterations” edit box. If minutes is selected, the test suite repeats until the number of minutes in the Minutes edit box have passed, and then stop after executing the final test of that suite.

Interpreting test results

Test results appear next to the enabled tests in the test area of the screen. Each time a test passes or fails during a loop, the appropriate pass or fail count increments. For failed tests, Field Replaceable Unit (FRU) information also appears under the “Details” column.

If you want greater detail for the test run, view the test log file. For information on how to view the test log file, refer to Section “Viewing the Test Log” below.

Getting help on individual tests

To display on-line help text files for a particular test, use the arrow keys to highlight the desired test and then press the F1 key. The application presents a text file that describes the sub tests for the highlighted test.

Viewing system information

To view system information, use the arrow keys to highlight the appropriate menu item, and press the Enter key. From the menu select the system information to be viewed.

After pressing the Enter key, the application displays a scrollable information box that contains system information.

Viewing the test log

By default, the diagnostic software keeps the log file in “efi\service\diagnostics” in a file named “fielddiags.log.”

To view this file, use the arrow keys to highlight the Platform Test menu and select View Results from that menu, by pressing the Enter key. After pressing the Enter key, the application displays a scrollable information box that contains the sessions test log. Because the log file is a Unicode file, you can also view it in the EFI shell by using the “type -u” command, and in the Windows operating system using the Notepad application.

All test results are appended to the previous log file. To clear the log file select the Clear log button on the View Results window. Note: because the log file is now always appended, it is recommended that the file be cleared a regular basis to keep the file size from getting too large.

EFI service partition

The EFI Service Partition provides the ability to remotely access an xSeries 382 server running EFI, via modem or LAN, for the purpose of executing configuration/setup utilities, remote diagnostics, and any other software designed to be compatible with this environment.

Service partition requirements

The SP may reside on any of the EFI-recognized physical drives. Drives not supported by EFI cannot be used for a service partition or EFI System Partition. An EFI System Partition cannot be installed on legacy MBR disks. The disk must be formatted as a GPT disk. (GUID Partition Table). This utility will not reinitialize a legacy MBR disk. The SP requires at least 65 MB free on the chosen EFI System Partition. For proper operation, there must be only one set of service partition files present.

Installing service partition files

The service partition on an Intel Itanium 2-based platform is part of the Extensible Firmware Interface (EFI) System Partition. This partition is not a separate, dedicated partition as is its functional counterpart on an IA-32 platform. The presence of “service partition” files within the existing system partition defines the EFI Service Partition.

The service partition is established when the installation program copies service partition files into the existing system partition. These files comprise utilities, diagnostics, and other software required for remote management. You can run the utilities and diagnostics located on the service partition either locally or remotely. In order to run the utilities and diagnostics you must boot the server from the partition. Applications that execute in the service partition run only on the managed server.

Installation requirements

Be sure you ad here to the following requirements when installing the service partition files:

- The current BIOS and firmware are installed.
- You must use the installation software on the xSeries 382 Resource CD.
- At least 125 MB or one percent of the selected drive must be available (as un-partitioned space).

Installing the files

Follow these steps to install the service partition files onto a managed server whose operating system is already installed:

- Insert the System Resource CD into the managed server's CD-ROM drive before booting to EFI Shell. Boot the system into EFI Shell, the EFI CD Menu program launches automatically. If the EFI CD Menu program does not launch in the EFI Shell, mount and map to the CD drive and type 'startup' and press Enter to launch the EFI CD Menu.
- From the menu tab, use the arrow keys to navigate over to the Utility menu and hit Enter or the down arrow to expand the menu.
- From the Utility menu, arrow down to "Install Service Partition" and hit Enter to launch the Service Partition Administration menu.
- Choose 3 and press Enter to install the service partition files.
- The installation software reports whether a system partition has been found. If so, it is recommended that you choose to install the service partition files onto the existing system partition. Do so by choosing 1 and pressing Enter.
- Choose the number for the system partition on which to install the partition files and press Enter.
- After receiving the message indicating that all files were installed successfully, press any key.
- Press ESC to exit the Service Partition Administration menu and return to the EFI CD menu.

Booting the server from the service partition

The service partition contains utilities and diagnostics. To run these utilities or diagnostics, you need to boot the server from the service partition. You can reboot a managed server from the service partition one of two ways: locally, or remotely. When you reboot the server to the service partition remotely, you can do the following:

- Run EFI shell commands on the server.
- Run a program from the service partition.
- Run diagnostics specific to the server.
- Run the SMU to configure the server for Server Management.

Follow these steps to locally boot the server to the service partition:

1. Restart the managed server.
2. Monitor the boot process and press F1 to enter BIOS setup. Arrow over to the "System Management" menu, and select "Enabled" for the "Service Boot" option. Hit the F10 to save the setting and exit out of the BIOS setup and the system automatically reboots to the Service Partition.

Memory errors

If a memory problem occurs, take the following actions before replacing a DIMM:

1. Reseat both DIMMs in the bank.
2. Check for a memory type mismatch in the bank.
3. Run the diagnostic tests.

Error symptom charts

You can use the error symptom charts to find solutions to problems that have definite symptoms (see “Error symptoms” on page 86).

If you cannot find the problem in the error symptom charts, go to “General checkout” on page 21 to test the server.

Small computer system interface messages

This information only applies if a storage expansion unit is available. If your receive a SCSI error message when running the SCSI Select Utility program, see “SCSI error codes” on page 87.

Note: If your server does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

Clearing CMOS

The CMOS must be cleared after the BIOS is updated. If using the *xSeries 382 BIOS Update CD*, the script will automatically clear the CMOS after the BIOS is updated. However if the *xSeries 382 BIOS Update CD* is not used, CMOS must be cleared manually. Clearing CMOS involves the following.

- Restarting the server with the new jumper setting.
- Restoring the jumper setting to its original position.
- Restarting the server a final time.

As an alternative, the CMOS clear button sequence can be used from the front panel. Use the following procedure to clear CMOS using the front panel button.

1. Power down the server by pressing and holding down the power button on the front control panel.
2. Hold down the power button down for several seconds.
3. Assure that the system is off and AC power is connected (5 V standby available).
4. Assure that the CMOS clear jumper is in the ’not clear’ position.
5. Hold down the Reset button for at least 4 seconds. Without letting up on the Reset button, press the On/Off button.
6. Release both the On/Off button and Reset button simultaneously. The system will emit one beep.

To clear the CMOS using the jumper on the main board follow these steps.

1. Turn off the server by pressing and holding down the power button on the front control panel. Hold down the power button for several seconds.
2. Unplug both power cords from the server.
3. Remove the top cover from the chassis.
4. Move the jumper at J5H3 from pins 1-2 to pins 2-3
5. Plug in the power cords.
6. Turn on the server by pressing the power button on the front control panel.
7. Wait the message NVRAM cleared is displayed on the screen, press F1to load the default settings, F2 to run Setup, or ESC to continue.

8. Power down the server by pressing and holding the power button on the front control panel. To do so, hold down the power button for several seconds.
9. Unplug both power cords from the server.
10. Move the jumper at J5H3 from pins 2-3 to pins 1-2.
11. Install the chassis cover.
12. Plug in the power cords.
13. Power on the server by pressing and holding the power button on the front control panel.

BIOS recovery mode

The BIOS Recovery Mode permits re-flashing the BIOS when the flash ROM has been corrupted. The sequence of events for automatic recovery is:

1. Insert the xSeries 382 BIOS Firmware Update CD and reset the system.
2. One beep indicates recovery media is valid, and the flash update has started.
3. Approximately two minutes later, two beeps indicate the flash update is complete.

   System automatically resets and starts the new BIOS.

Note: BIOS recovery requires an “El Torito” formatted CD; alternate forms of removable media including USB devices are not supported and will result in a continuous beep code (approximately 1 beep every 2 seconds until the system is powered down).

Use the following procedure to initiate the BIOS recovery mode:

1. Turn off the server.
2. Unplug both power cords from the server.
3. Move the jumper at J5H1 Labeled ’RCV BOOT’ from pins 1-2 to pins 2-3.
4. Reconnect the AC power and switch server power on. CD Recovery activity will begin. One full beep is emitted as the server begins to load the image (.REC file type) from disk to memory.
5. Wait two minutes. Two beeps indicate the BIOS recovery has completed successfully.
6. Remove the CD and power down the server.
7. Unplug both power cords from the server.
8. Move the jumper at J5H1 from pins 2-3 to pins 1-2.
9. Reconnect AC power and power on the server.
10. Follow any other instructions in the BIOS release notes.

Support telephone numbers

View support telephone numbers at http://www.ibm.com/planetwide/ on the World Wide Web.

Chapter 4. Customer replaceable units

This chapter provides basic instructions for installing a limited number of hardware options in your server. These instructions are intended for users who are experienced with setting up IBM server hardware. If you need more detailed instructions, see the *Option Installation Guide* on the IBM *xSeries Documentation* CD.

Attention: All components inside the server must be removed or replaced by a service technician.

Installation guidelines

Before you begin installing options in your server, read the following information:

- Review the Appendix B, “Related service information”, on page 95 and “Handling static-sensitive devices” on page 98. This information will help you work safely with your server and options.
- Make sure that you have an adequate number of properly grounded electrical outlets for your server, monitor, and other devices that you will connect to the server.
- Back up all important data before you make changes to disk drives.
- You do not need to turn off the server to install or replace hot-swap drives or hot-plug Universal Serial Bus (USB) devices. For servers with redundant power (three power supplies), you do not need to turn off the server to install or replace a hot-swap power supply.
- The blue color on components and labels identifies touch points, where you can grip a component, move a latch, and so on.
- For a list of supported options for your server, go to http://www.ibm.com/pc/compat/.

System reliability guidelines

To help ensure proper cooling and system reliability, make sure that:

- Each of the hot-swap drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- Each of the two hot-swap power supply bays on the right has a power supply installed in it. The third (left) power supply bay must have a power supply or filler panel installed in it.
- For proper cooling and airflow, replace the server cover before turning on the server. Operating the server for extended periods of time (over 30 minutes) with the server cover removed might damage server components.
- After installing the server in a rack, make sure that space is available around the server to enable the server cooling system to work properly. See the documentation that comes with the rack for additional information.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan as soon as possible.
- For servers with redundant power (three power supplies), you have replaced a hot-swap power supply as soon as possible. For servers with non-redundant power (two power supplies), a power supply should not be removed while the server is turned on.
- You replace a hot-swap drive within 2 minutes of its removal.

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Handling static-sensitive devices

Attention: Static electricity can damage electronic devices, including your server. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you. Wearing an anti-static wrist strap attached to an unpainted metal part of the server can provide some electrostatic discharge protection when handling server components.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the server for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the server without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on your server cover or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

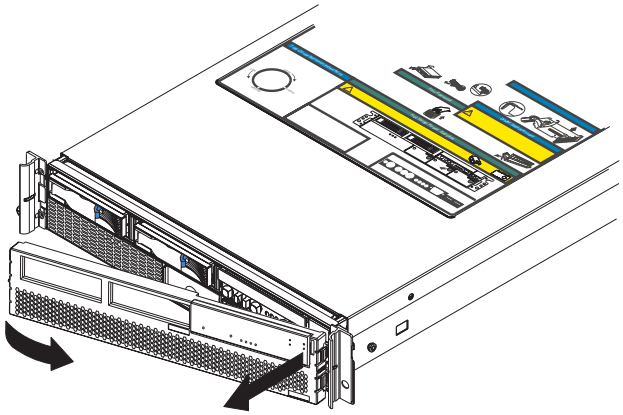
Removing the bezel

You must remove the bezel to access the hot-swap power supplies and view the power status LEDs.

Note: The bezel does not come pre-installed on your server. See “Replacing the bezel” on page 47 for bezel installation instructions.

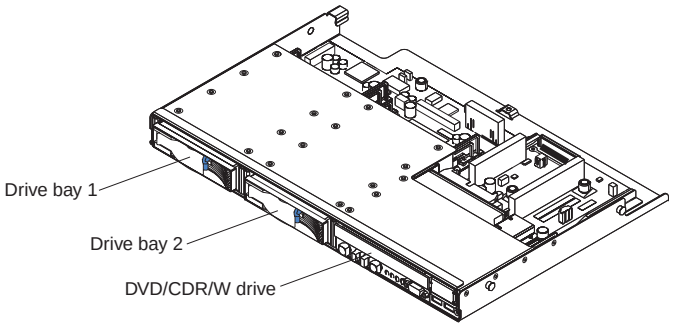
Complete the following steps to remove the bezel:

1. Pull the bezel away from the front of the server to remove it.
2. Store the bezel in a safe place.



Installing internal drives

Your server comes with an EIDE DVD/CD-RW combo drive and one or two hot-swap SCSI hard disk drives.



Notes:

1. The electromagnetic interference (EMI) integrity and cooling of the server are protected by having all bays and PCI slots covered or occupied. When you install a drive or PCI adapter, save the EMC shield and filler panel from the bay or the PCI adapter slot cover in the event you later remove the option.
2. For a complete list of supported options for your server, go to http://www.ibm.com/pc/support.

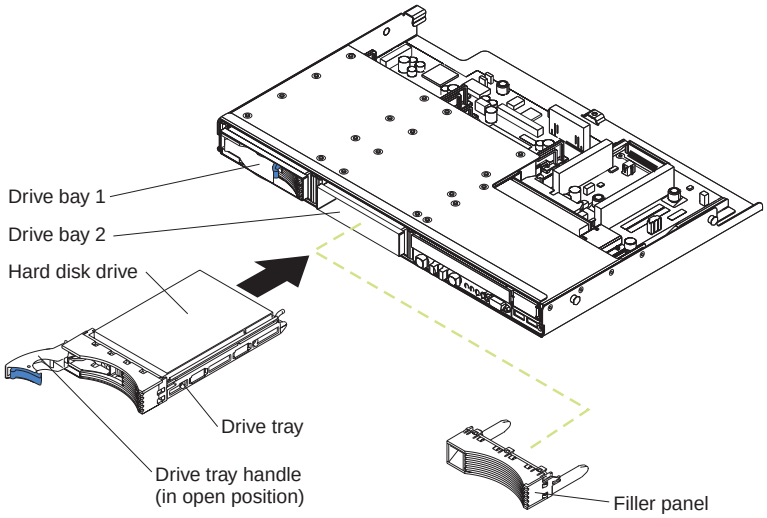
Installing a hot-swap drive

Your server supports a maximum of two 1-inch (26 mm) slim-high, 3.5-inch, hot-swap hard disk drives in the standard hot-swap bays. The hot-swap bays are next to each other on the front of the server, and can be accessed without removing the bezel.

Notes:

1. All hot-swap drives being used in the server should have the same speed rating; mixing speed ratings will cause all drives to operate at the lower speed.
2. You do not have to turn off the server to install hot-swap drives in the hot-swap drive bays. However, you must turn off the server when performing any steps that involve installing or removing cables.

The following illustration shows how to install a hot-swap hard disk drive.



Complete the following steps to install a drive in a hot-swap bay.

Attention: To maintain proper system cooling, do not operate the server for more than 10 minutes without either a drive or a filler panel installed in each hot-swap drive bay.

1. Review the “Installation guidelines” on page 43, and “Handling static-sensitive devices” on page 44.
2. Remove the filler panel from the empty hot-swap bay by inserting your finger into the depression at the left side of the filler panel and pulling it away from the server.
3. Install the hard disk drive in the hot-swap bay:
   a. Ensure that the tray handle is open (that is, perpendicular to the drive).
   b. Align the drive assembly with the guide rails in the bay.
   c. Gently push the drive assembly into the bay until the drive stops.
   d. Push the tray handle to the closed (locked) position.
   e. Check the hard disk drive status indicator to verify that the hard disk drive is operating properly.

      When the amber hard disk drive status LED is lit continuously, this indicates that the drive is faulty and needs to be replaced. When the green hard disk drive activity LED is flashing, this indicates that the drive is being accessed.
4. If you are installing additional hot-swap hard disk drives, do so now.

5. If you have a power supply to install or remove, do so now; otherwise go to “Completing the installation”.

SCSI IDs for hot-swap hard disk drives

The hot-swap-drive backplane controls the SCSI IDs for the internal hot-swap drive bays. Table 12 lists the SCSI IDs for the hard disk drives that are connected to the primary SCSI channel.

Table 12. SCSI IDs for hot-swap hard disk drives

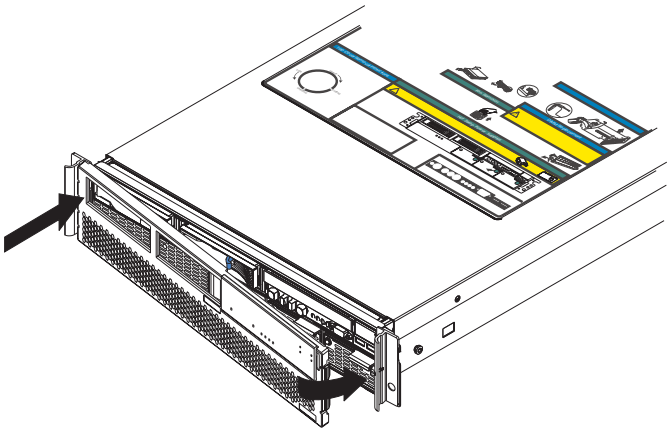
Device	SCSI ID
Drive bay 1	0
Drive bay 2	1

Completing the installation

To complete your installation, you must install the bezel; then, connect all the cables and, for certain options, run the Configuration/Setup Utility program. Follow the instructions in this section.

Replacing the bezel

The following illustration shows how to install the bezel on the server.



Complete the following steps to replace the bezel:

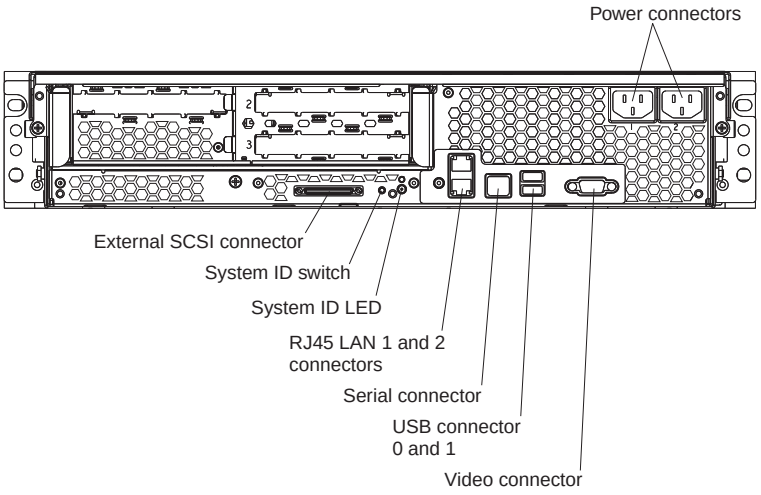
1. Insert the two tabs on the ends of the bezel into the matching holes on the server chassis.
2. Push the bezel toward the server until the two tabs snap into place.

Cabling the server

If your server cables and connector panel have color-coded connections, match the color of the cable end with the color of the connector. For example, match a blue cable end with a blue panel connector, a red cable end with a red connector, and so on.

Attention: To prevent damage to equipment, connect the power cords last.

The following illustration shows the input/output (I/O) connectors on the rear of the server.



Updating your server configuration

When you start your server for the first time you need to set the system date and time using the Configuration/Setup Utility program. When you start your server for the first time after you add or remove an internal option or an external SCSI device, you might see a message telling you that the configuration has changed. The Configuration/Setup Utility program automatically starts so that you can save the new configuration information. See Chapter 2, “Configuring your server”, on page 17 for additional information.

Some options have device drivers that you need to install. See the documentation that comes with your option for information about installing any required device drivers.

Your server comes with two microprocessors installed on the system board and can operate as a symmetric multiprocessing (SMP) server. However, you might need to upgrade your operating system to support SMP. See your operating-system documentation for additional information.

If any of the optional external hard disk drives connected to your server have a RAID configuration using a ServeRAID controller and you have installed or removed a hard disk drive, see the ServeRAID documentation for information about reconfiguring your disk arrays. ServeRAID documentation is available for download from the IBM Web site at http://www.ibm.com/pc/support.

Chapter 5. Service replaceable units

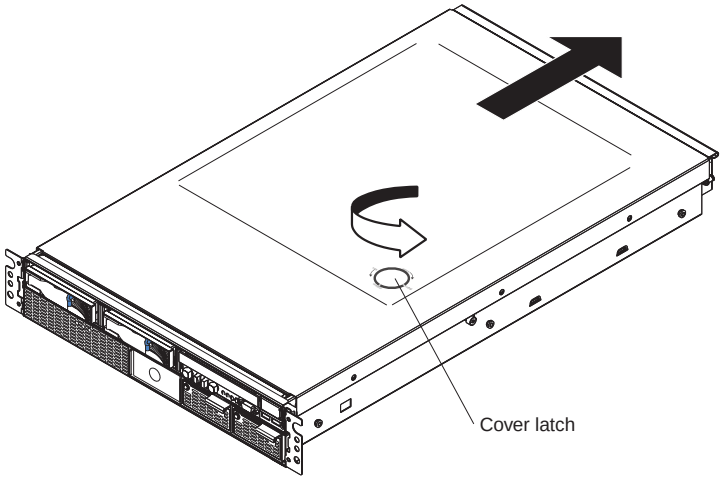
This chapter describes the removal of server components.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM products. See the parts listing in "System" on page 92 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Cover removal and replacement

Complete the following steps to remove the cover:

1. Review the "Safety information" on page 95 and "Installation guidelines" on page 43.
2. Turn off the server; then, disconnect the power cord.
3. Rotate the cover latch as shown (using a screwdriver or a coin) on the service label to release it; then, push the cover toward the rear of the server. Lift the cover off the server and set it aside.



Complete the following steps to replace the cover:

1. Before installing the cover, check that all cables, adapters, and other components are installed and seated correctly and that you have not left loose tools or parts inside the server.
2. Make sure the cover latch is in the unlocked position, as shown on the system service label.
3. Place the cover on the server chassis slightly back from its closed position.

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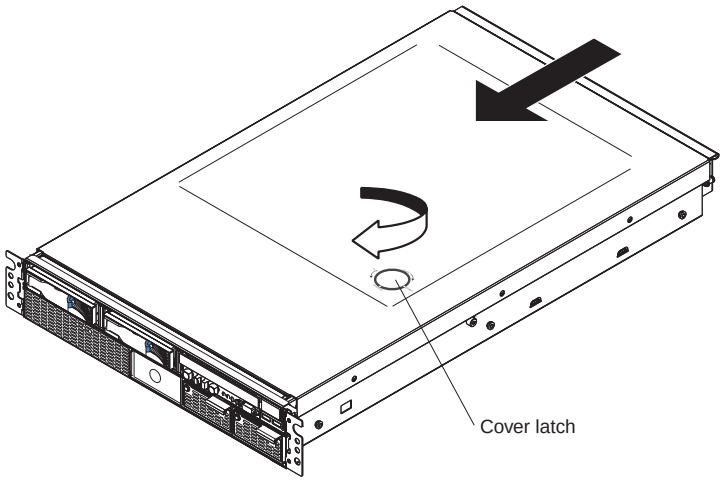
4. Slide the cover forward until it locks in place and rotate the cover latch as shown on the system service label to secure the cover.



Working with adapters

Your server comes with adapter connectors or *slots* on a PCI riser that is connected to the system board. You can install up to three additional optional adapters in PCI-X slots 1 through 3 (PCI 1 through PCI 3). See “Option connectors” on page 12 for the locations of expansion slots on the PCI riser.

Attention: All components inside the server must be removed or replaced by a service technician.

Adapter considerations

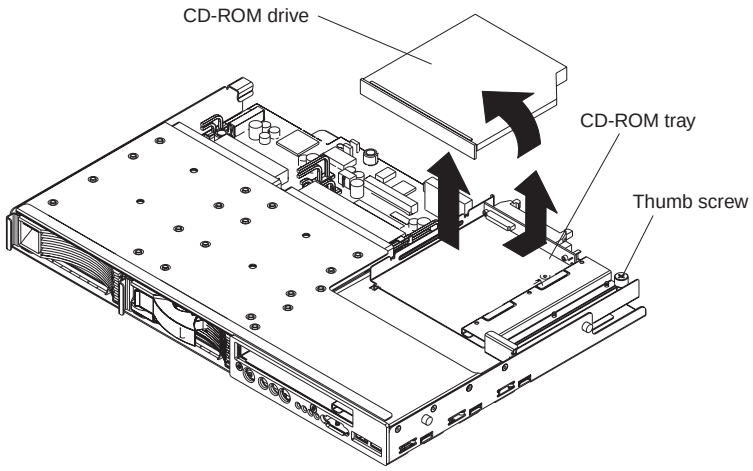
Before you install an adapter, review the following information:

- Read the documentation that comes with your operating system.
- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions for the server. If you need to change the switch or jumper settings on your adapter, follow the instructions that come with the adapter.
- The total power consumption of all adapters installed in the server must not exceed 45 watts.
- You can install full-length adapters in expansion slots PCI 1, PCI 2, and PCI 3. None of the expansion slots are hot-plug.
- The 64-bit PCI-X slots support 3.3 V signaling PCI or PCI-X adapters; they do not support 5.0 V signaling adapters.
- The PCI bus configuration is as follows:
  - The dual-channel integrated Ethernet controller is on PCI-X bus 2, channel A.
  - The dual-channel integrated SCSI controller is on PCI-X bus 2, channel B.
  - The 64-bit, 133 MHz PCI-X slot 3 is on PCI-X bus 1, channel A.
  - The 64-bit, 100 MHz PCI-X slots 1 and 2 are on PCI-X bus 1, channel B.
- The server scans the PCI devices in the following order: PCI-X slot 3, PCI-X slots 1 and 2; then, the dual-channel integrated Ethernet controller and the dual-channel integrated SCSI controller.
- For a list of supported options for your server, go to http://www.ibm.com/pc/compat/.

CD-ROM drive removal and replacement

Complete the following steps to remove the CD-ROM drive.

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices see “Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Remove the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).
6. Remove the fan assembly and air baffle (see “Fan assembly and air baffle removal and replacement” on page 56).
7. Remove the front panel board (see “Front panel board removal and replacement” on page 65).
8. Disconnect the cables from the rear of the CD-ROM drive and move them aside.
9. Loosen the thumb screw holding the CD-ROM tray in place; then, slide the CD-ROM assembly toward the rear of the server and lift the assembly out of the server.



10. Lift the CD-ROM drive out of the tray by lifting up on the angled side of the drive.

To replace the CD-ROM drive, reverse the previous steps.

Hot-swap fan removal and replacement

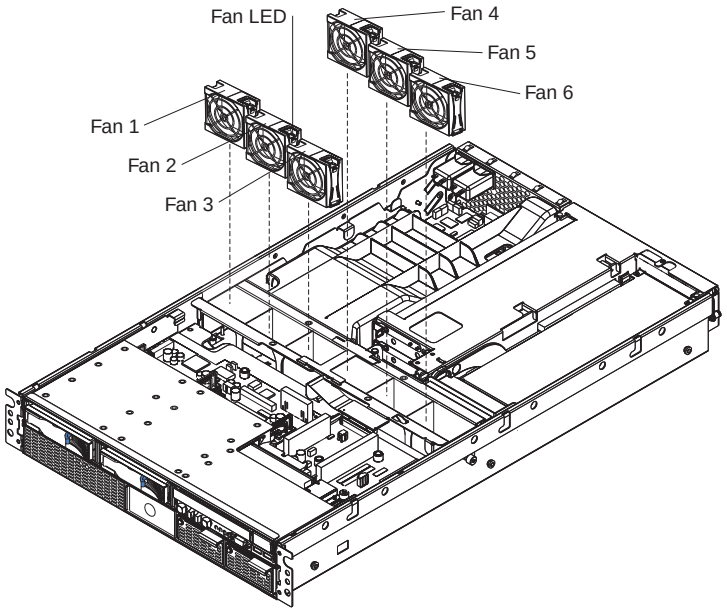
Complete the following steps to remove a hot-swap fan:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices (see “Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. If the server is rack-mounted, slide the server out far enough to remove the top cover.

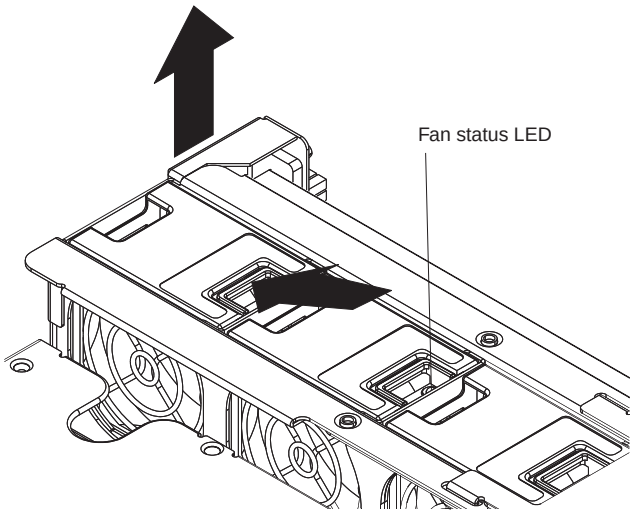
   CAUTION:
   Ensure that the rack is anchored securely to keep it from tilting forward when you extend the server out of the rack.
5. Remove the cover (see “Cover removal and replacement” on page 49).

   Attention: To maintain proper cooling, replace the cover within 30 minutes.
6. Determine the fan you want to replace.

   Attention: To ensure optimal airflow and cooling, replace the fan within two minutes.



7. Press the fan-release latch in the direction indicated by the arrow.



8. Pull the fan out of the server.
9. Align the two tabs on the replacement fan with the notches in the server and press the fan into the corresponding connector. Press the fan firmly to engage the latch fully and secure the fan in the server.
10. If the server is turned on, verify that the new fan is running and that its failure LED is not lit. If the fan is not running or if its failure LED is lit, reseat the fan.
11. Replace the cover (see “Cover removal and replacement” on page 49).

Hot-swap power supply removal and replacement

Your server comes with two or three hot-swap power supplies. For servers with two power supplies, you must turn off the server before replacing a power supply. For servers with three power supplies, you do not need to turn off the server to replace a hot-swap power supply, but you must replace only one power supply at a time.

Attention: Your server has hot-swap power supply capability only when three power supplies are installed. In addition, your server has redundant power capability only when three power supplies are installed.

If you install or remove a power supply, observe the following precautions.

Statement 8

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

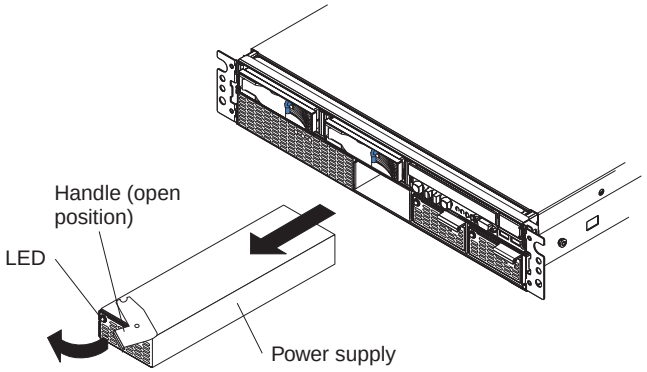
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 12

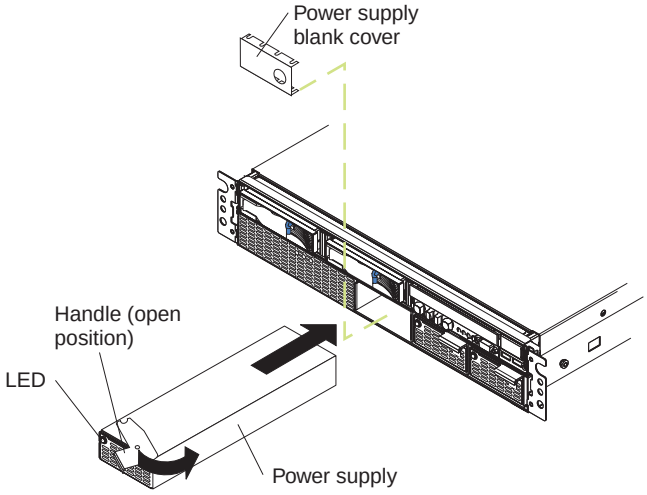
CAUTION:
The following label indicates a hot surface nearby.

Complete the following steps to replace a hot-swap power supply:

1. Review the safety information beginning on page 95 and “Installation guidelines” on page 43.
2. Remove the server bezel (see “Removing the bezel” on page 45).
3. If your server has only two power supplies installed, turn off the server (see “Turning off the server” on page 9).
4. Press the orange release lever on the selected power supply; then, pull the power supply out of the bay and set it aside.



5. Make sure the power-supply handle is in the open position; then, slide the power supply all the way into the chassis before placing the power-supply handle into the locked position.

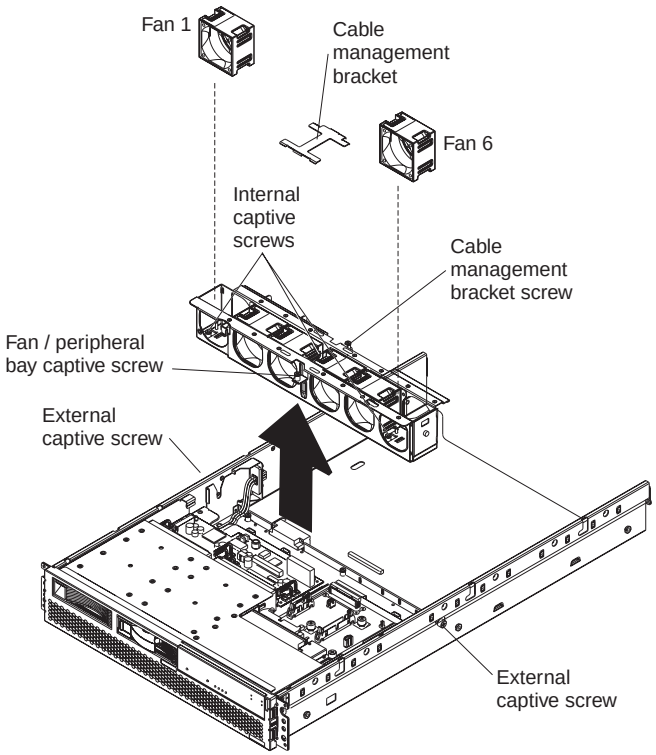


6. If the server is not turned on, turn on the server (see “Turning on the server” on page 8).
7. Verify that the ac power LEDs on the server and the PS dc power LEDs on each power supply are lit, indicating that power supplies are installed and operating properly.
8. Replace the server bezel (see “Replacing the bezel” on page 47).

Fan assembly and air baffle removal and replacement

Complete the following steps to remove the fan assembly and air baffle.

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices, see “Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Remove the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).
6. Remove the four screws securing the air baffle.
7. Remove the screw securing the cable management plate on the fan bracket; then, remove the cable management plate.
8. Disconnect the P1 cable from the front panel board, and the SCSI backplane F2 cable from the SCSI backplane board. Lift the cables out of the cable channel in the fan bracket and move them out of the way.
9. Remove the two screws from the cable channel.
10. Remove the fan at each end of the fan bracket (fans 1 and 6). See “Hot-swap fan removal and replacement” on page 52.
11. Remove or loosen the screws (depending on the type of screw) holding the fan bracket in place located:
    - Beneath fans 1 and 6
    - In the cable channel
    - On the outside of the chassis, at each end of the fan bracket



12. Lift the fan bracket and air baffle together from the server and set them aside.

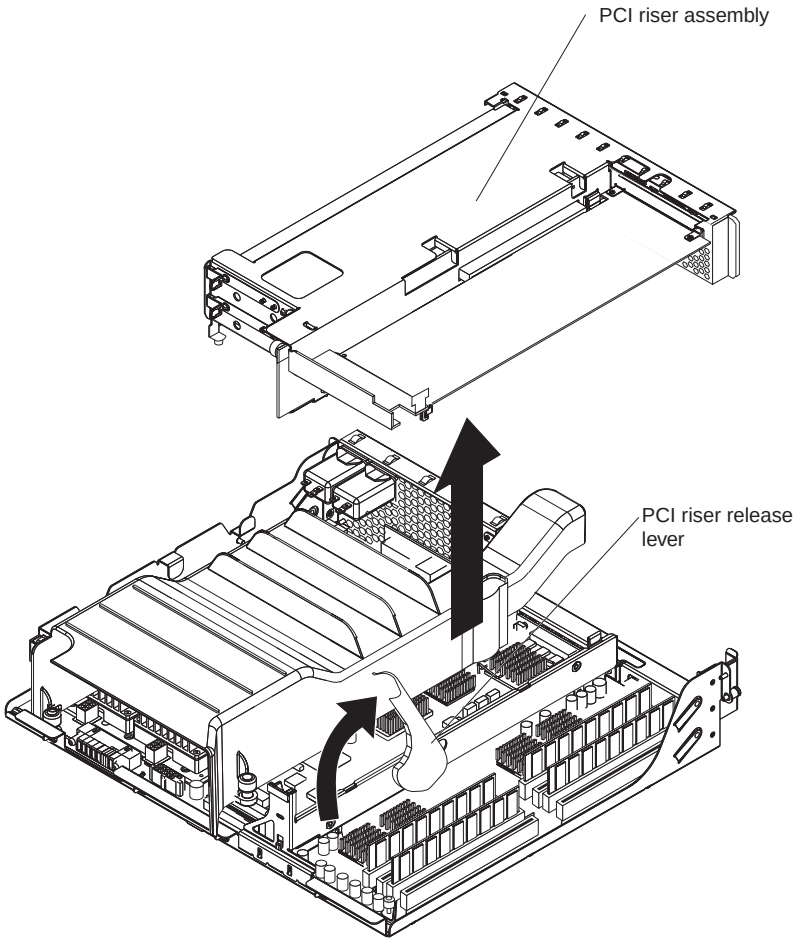
To replace the fan bracket and air baffle, reverse the previous steps.

PCI riser assembly removal and replacement

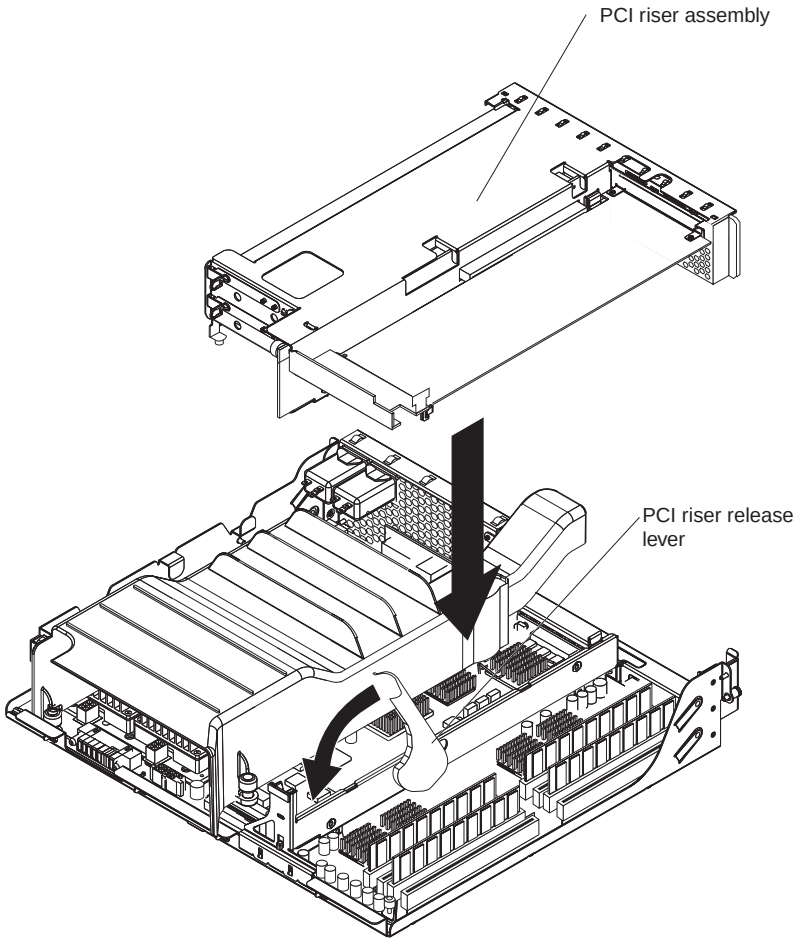
Complete the following steps to remove the PCI riser assembly:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices, see“Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Disconnect any internal cables that are attached to optional adapters.
6. **Attention:** To prevent damage to the PCI riser assembly connector and system board connector, ensure that the four corners of the PCI riser assembly are parallel to the system board and the connector on the PCI riser assembly and system board are aligned before and while rotating the release lever.
   Rotate the PCI riser assembly release lever in small 30 degree increments stopping periodically to adjust the corners of the assembly to ensure that the assembly is parallel to the system board. A full 90 degree rotation of the release lever is required.
   Rotate the PCI riser assembly release lever toward the rear of the server until it stops.

7. Lift the PCI riser assembly straight up and away from the system board and remove it from the server. Store the PCI riser in a safe place.



The following illustration shows how to install the PCI riser in the server.



Complete the following steps to replace the PCI riser assembly:

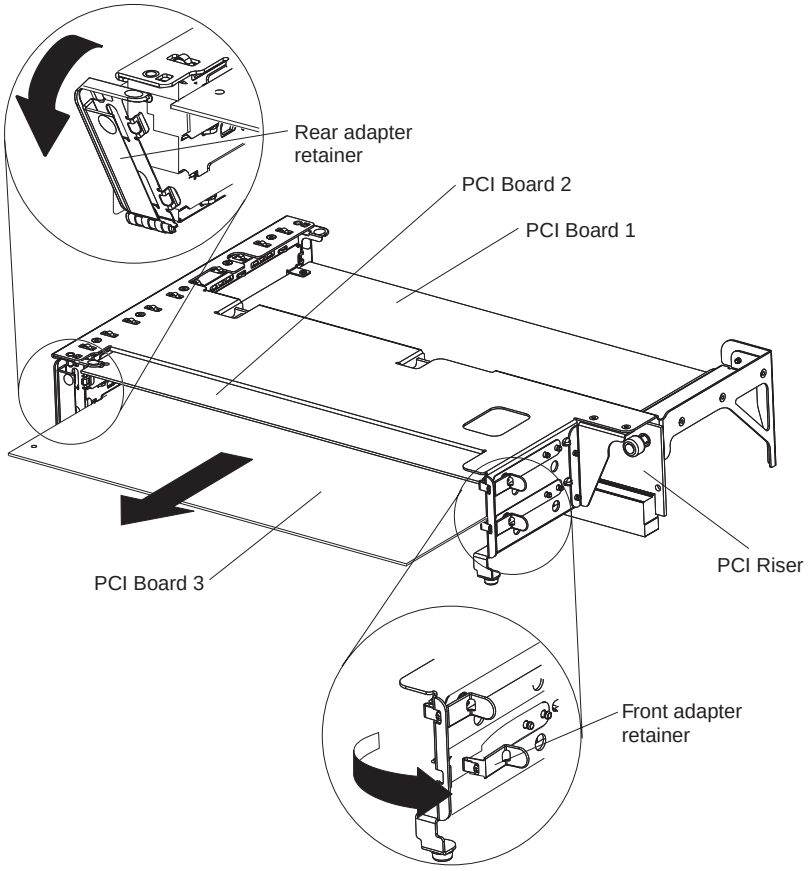
1. Place the PCI riser assembly release lever is in the extended position.
2. Insert the PCI riser assembly into the guides and press it down toward the system board until it stops.
3. **Attention:** To prevent damage to the PCI riser assembly connector and system board connector, ensure that the four corners of the PCI riser assembly are parallel to the system board and the connector on the PCI riser assembly and system board are aligned before and while rotating the release lever.
   Rotate the PCI riser assembly release lever in small 30 degree increments stopping periodically to adjust the corners of the assembly to ensure that the assembly is parallel to the system board. A full 90 degree rotation of the release lever is required.
   Rotate the PCI riser assembly release lever toward the front of the server until it stops.
4. Connect any internal cables that are required for optional adapters. Route cables so that they do not block the flow of air from the fans.
5. Replace the cover (see “Cover removal and replacement” on page 49.

Adapter removal and replacement

Complete the following steps to remove an adapter from your server:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices (see “Turning off the server” on page 9).
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Remove the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).

   Note: You might find it easier to remove the adapter if the PCI riser assembly is on its side with the expansion slot facing up.
6. Release the adapter retention clip latch; then, open the adapter retention clip.
7. Grasp the adapter by the top edge or upper corners and slide it out of the slot.



Complete the following steps to replace an adapter in your server:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices.
3. Disconnect all power cords; then, disconnect all external cables.
4. Remove the cover (see “Cover removal and replacement” on page 49).

5. Remove the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).

   Note: You might find it easier to install the adapter if the PCI riser assembly is on its side with the expansion slot facing up.

6. Determine which slot you will use for the adapter. Check the instructions that come with the adapter for any requirements, restrictions, or cabling instructions.
7. Release the adapter retention clip latch; then, open the adapter retention clip.

   Note: If you are installing a full-length adapter, there are adapter retention clips at both ends of the adapter slot.

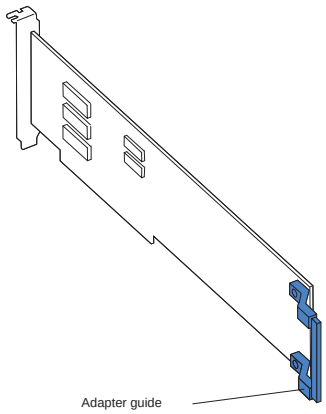
8. Grasp the expansion-slot cover and pull it out of the expansion slot. Store it in a safe place for future use.

   Note: Expansion-slot covers must be installed on all vacant slots. This maintains the electronic emissions standards of the server and ensures proper ventilation of server components.

9. Set any jumpers or switches on the adapter or system board according to the documentation that comes with the adapter.

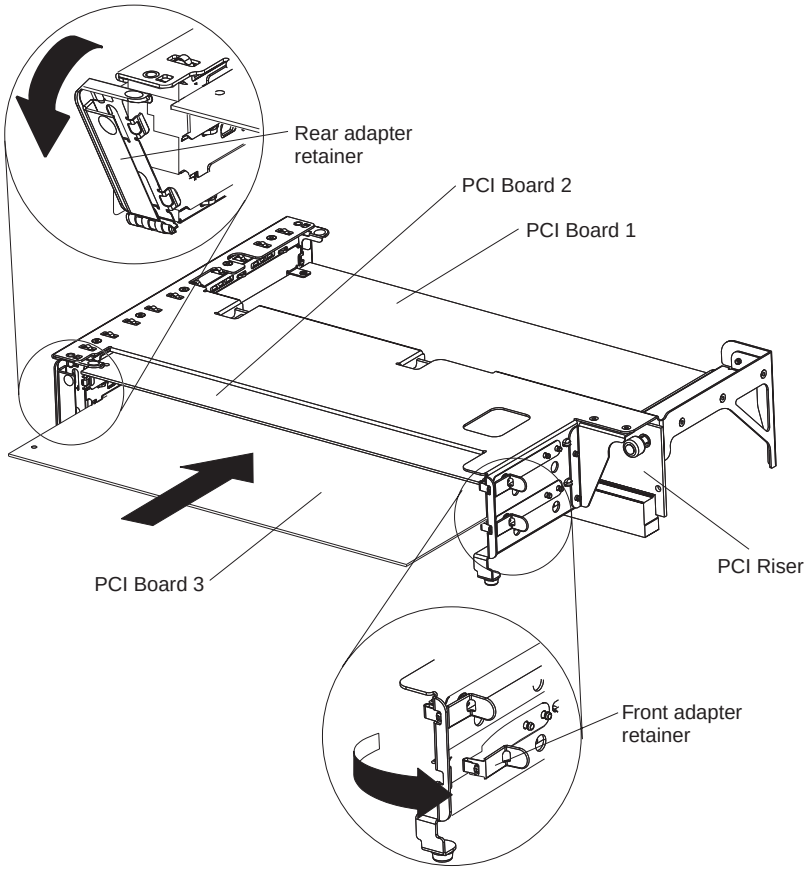
   Attention: Avoid touching the components and gold-edge connectors on the adapter.

10. If you are installing a full-length adapter, remove the blue adapter guide (if any) from the end of the adapter.



    Attention: Be certain that the adapter is correctly seated in the expansion slot. Incomplete installation of an adapter might damage the system board or the adapter.

11. Carefully grasp the adapter by the top edge or upper corners, and align it with the expansion slot guides; then, press the adapter *firmly* into the expansion slot. Move the adapter directly from the static-protective package to the adapter slot.



12. If you have another adapter to install, repeat steps 6 through 11 on page 61. Otherwise, close the adapter-retention clip over the top corner of the adapter. Make sure the adapter-retention clip latch is in the locked (closed) position.

    Note: If you are installing a full-length adapter, there are adapter retention clips at both ends of the adapter slot.

13. If you have other options to install, do so now; otherwise, continue with step 14.
14. Replace the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).
15. Replace the cover (see “Cover removal and replacement” on page 49).
16. Reconnect the external cables and power cords; then, turn on the attached devices and the server.

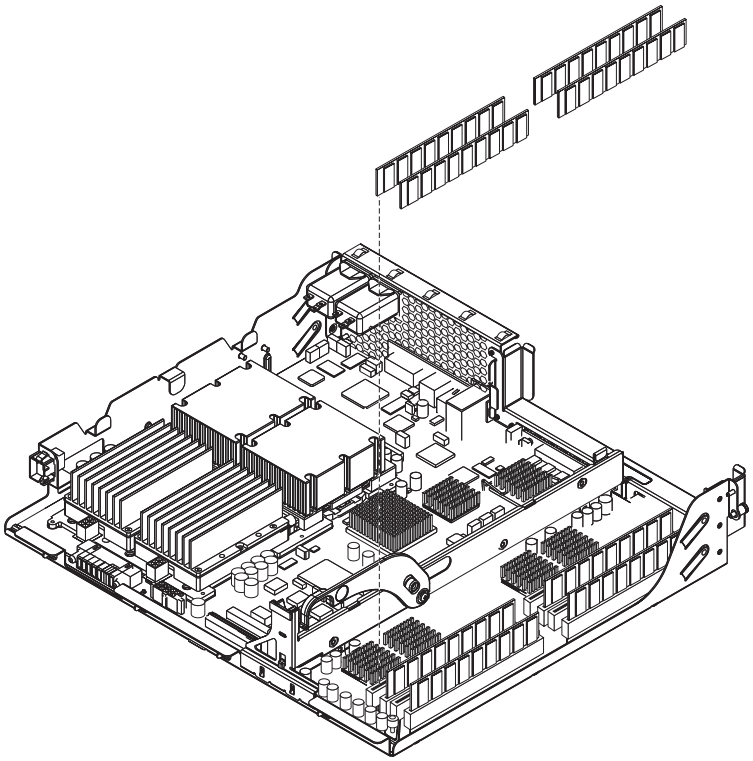
Memory DIMMs removal and replacement

Complete the following steps to remove and replace memory DIMMs.

Important: Memory is 4-way interleaved and must be populated in sets consisting of identical type/size DIMMs.

Complete the following steps to remove a DIMM:

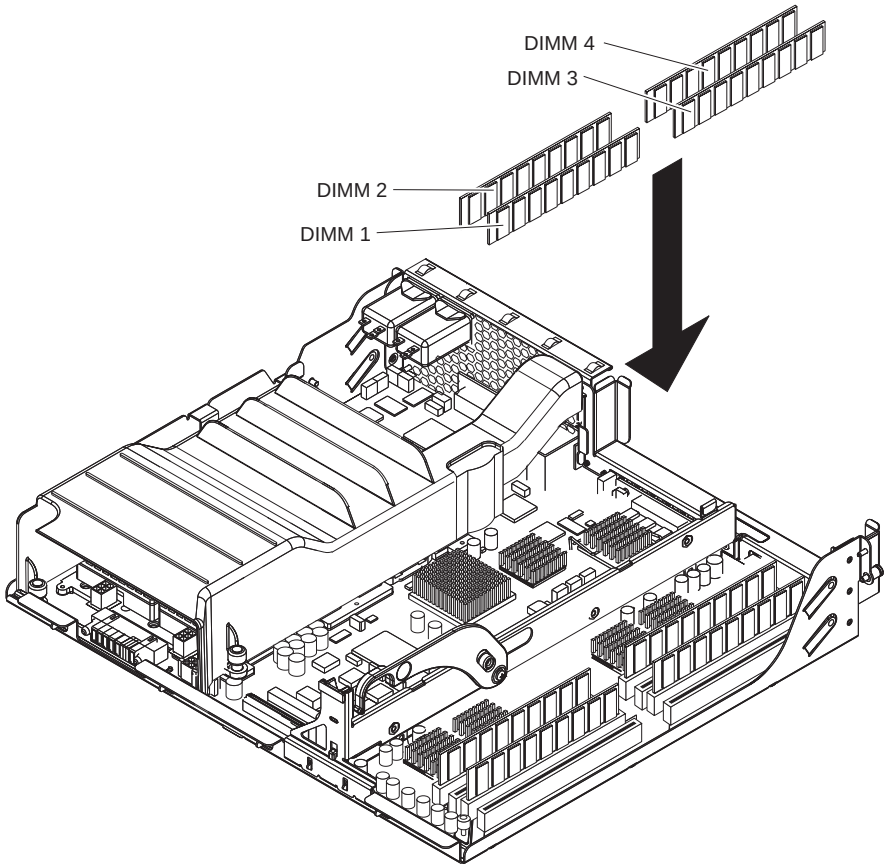
1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and disconnect all power cords and external cables; then, remove the cover (see “Cover removal and replacement” on page 49).
3. Remove the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).
4. Locate the DIMM connectors on the system board. Determine the DIMM that you want to replace.
5. Open the retaining clips and remove the existing DIMM.



Complete the following steps to replace a DIMM:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and disconnect all power cords and external cables; then, remove the cover (see “Cover removal and replacement” on page 49).
3. Remove the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).
4. Locate the DIMM connectors on the system board. Determine the connectors into which you will install the DIMMs.
5. Open the retaining clips, if necessary, remove any existing DIMMs.

6. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server; then, remove the new DIMM from the package.
7. Gently open the retaining clip on each end of the DIMM slot. Turn the DIMM so that the pins align correctly with the connector.
8. Insert the DIMM into the connector. Firmly press the DIMM straight down into the connector by applying pressure on both ends of the DIMM simultaneously. The retaining clips snap into the locked position when the DIMM is firmly seated in the connector. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Open the retaining clips, remove the DIMM, and then reinsert it.

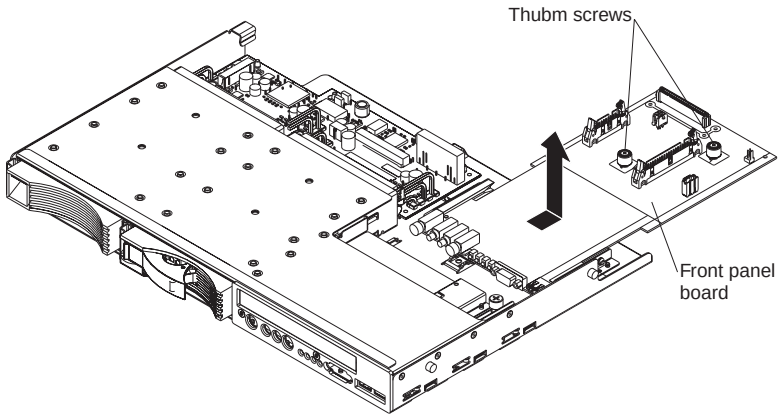


9. If you have other options to install or remove, do so now.
10. Replace the PCI riser assembly (see “PCI riser assembly removal and replacement” on page 57).
11. Replace the cover (see “Cover removal and replacement” on page 49).
12. Reconnect the external cables and power cords. Turn on the attached devices, and turn on the server.

Front panel board removal and replacement

Complete the following steps to remove the front panel board.

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices (see “Turning off the server” on page 9).
3. Remove the cover (see “Cover removal and replacement” on page 49).
4. Disconnect all external cables and power cords.
5. Disconnect the cables from the rear of the CD-ROM drive and move them aside.
6. Disconnect the cables from connectors J2B1 and J1D1 on the front panel board and move them out of the way.
7. Loosen the two thumb screws holding the front panel board in place.
8. Slide the front panel board toward the rear of the server as far as it will go.
9. Loosen the thumb screw holding the CD-ROM tray in place; then, slide the CD-ROM assembly toward the rear of the server and lift the assembly out of the server.

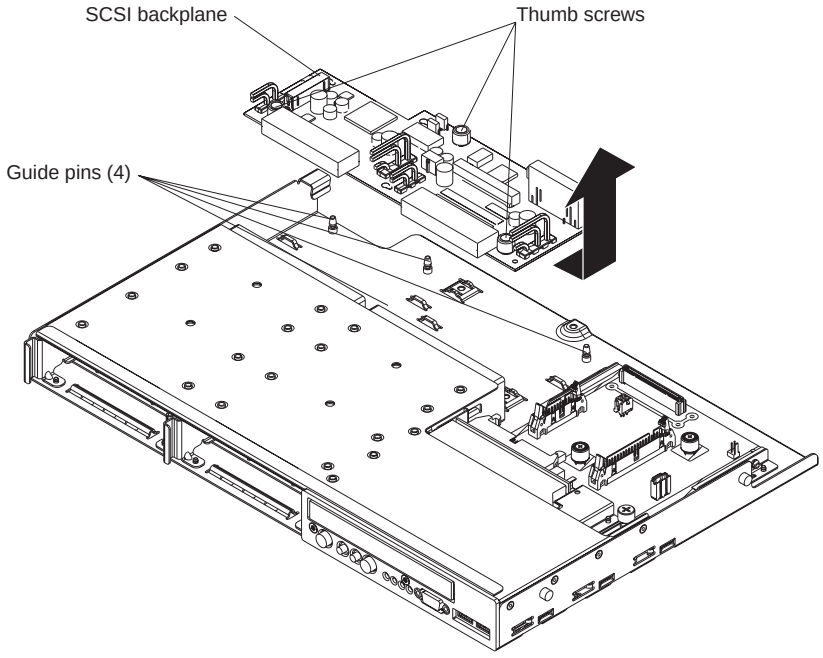


To install the replacement front panel board, reverse the previous steps.

SCSI backplane removal and replacement

Complete the following steps to remove the front panel board.

1. “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices, see“Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Remove all hard disk drives from the drive bays.
6. Remove the screw securing the cable retainer on the fan bracket; then, remove the cable retainer.
7. Disconnect all cables from the SCSI backplane.
8. Remove the three screws holding the SCSI backplane in place.



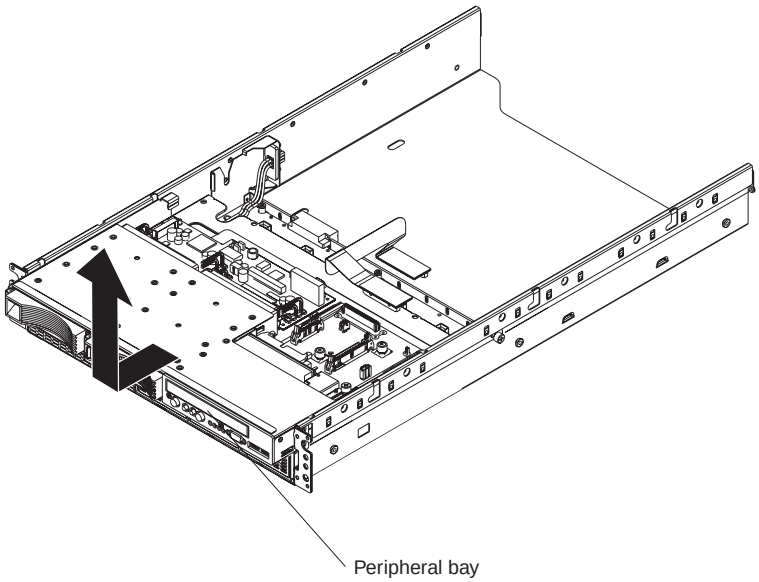
9. Slide the SCSI backplane toward the front panel board about 0.6 cm (0.2 in.) until it stops.
10. Lift the SCSI backplane out of the server.

To replace the SCSI backplane, align the three keyhole-shaped slots with the three cylindrical pins on the peripheral module; then, reverse the steps for removing the SCSI backplane.

Peripheral bay removal and replacement

Complete the following steps to remove the peripheral bay:

1. “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices (see “Turning off the server” on page 9).
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Disconnect the P1 cable from the front panel board, the SCSI backplane F2 cable and power cables from the SCSI backplane board
6. Loosen the single screw on the rear of the peripheral bay (near the center of the fan assembly).
7. Slide the peripheral bay toward the front of the server as far as it will go (approximately 1-inch), lift it straight up and remove it from the server.



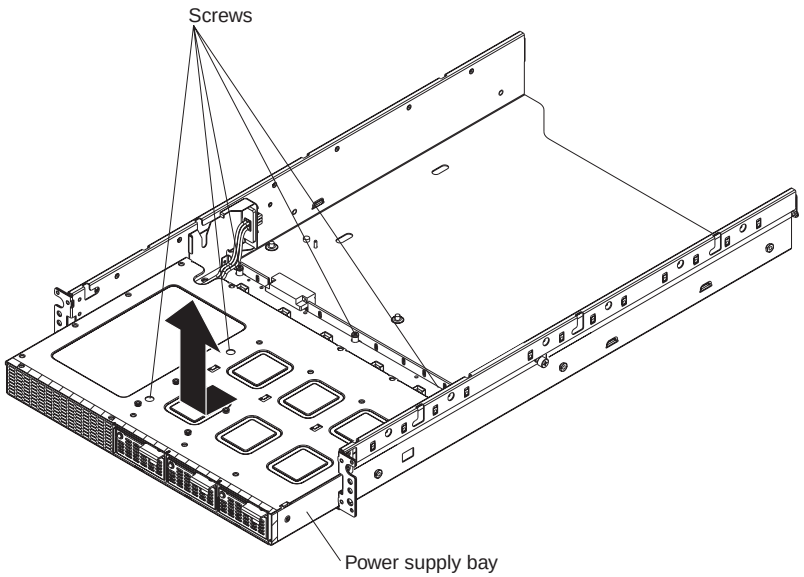
8. Place the peripheral bay on a clean, static-free work space.

To replace the peripheral bay, reverse the previous steps.

Power supply bay removal and replacement

Complete the following steps to remove the power supply bay:

1. “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices (see “Turning off the server” on page 9).
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Remove the hot-swap power supplies (see “Power pod removal and replacement” on page 75).
6. Remove the screw securing the cable management plate from the center of the fan assembly.
7. Disconnect the P1 cable from the front panel board, the SCSI backplane F2 cable and power cable from the SCSI backplane board and move them out of the way.
8. Loosen the retaining screw on the peripheral bay.
9. Slide the peripheral bay toward the front of the server, lift up and remove it from the server.
10. Remove the fan assembly and air baffle (see “Fan assembly and air baffle removal and replacement” on page 56).
11. Loosen the two screws (located near memory slot 1 and the ac power connector) at the back of the chassis that secures the Electronics bay. Slide the Electronics bay toward the rear of the server (approximately 1-inch) to access and loosen the three retention screws at the rear of the power supply bay.
12. Loosen the two screws on top of the power supply bay.
13. Lift up the power supply bay and remove it from the server.



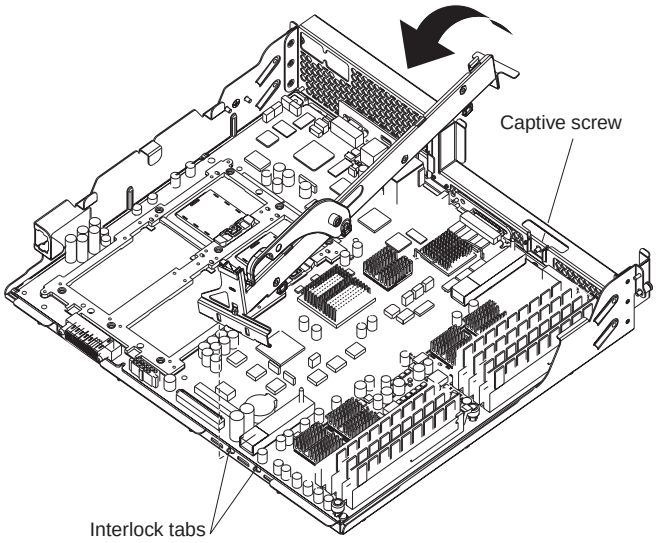
Complete the following steps to replace the power supply bay:

1. Remove the hot-swap power supplies from the power supply bay.
2. Slide the power supply bay in from the front of the server.
3. Align and tighten the three retention screws at the rear of the power supply bay.
4. Replace the two screws on top of the power supply bay.
5. Slide the Electronics bay toward the rear of the chassis as far as it will go; then, tighten the two screws at the rear of the chassis to secure the Electronics bay.
6. Place the peripheral bay assembly on top of the power supply bay and slide the peripheral bay toward the rear of the server as far as it will go; then, tighten the retaining screw at the rear of the peripheral bay to secure it.
7. Reconnect all cables that were disconnected.
8. Reinstall the fan assembly.
9. Reattach the cable management plate to the fan assembly.
10. Install the fans in the fan bay. Align the two tabs on the replacement fan with the notches in the server and press the fan into the corresponding connector. Press the fan firmly to engage the latch fully and secure the fan in the server.
11. Reinstall the power supplies.
12. Replace the cover (see “Cover removal and replacement” on page 49).

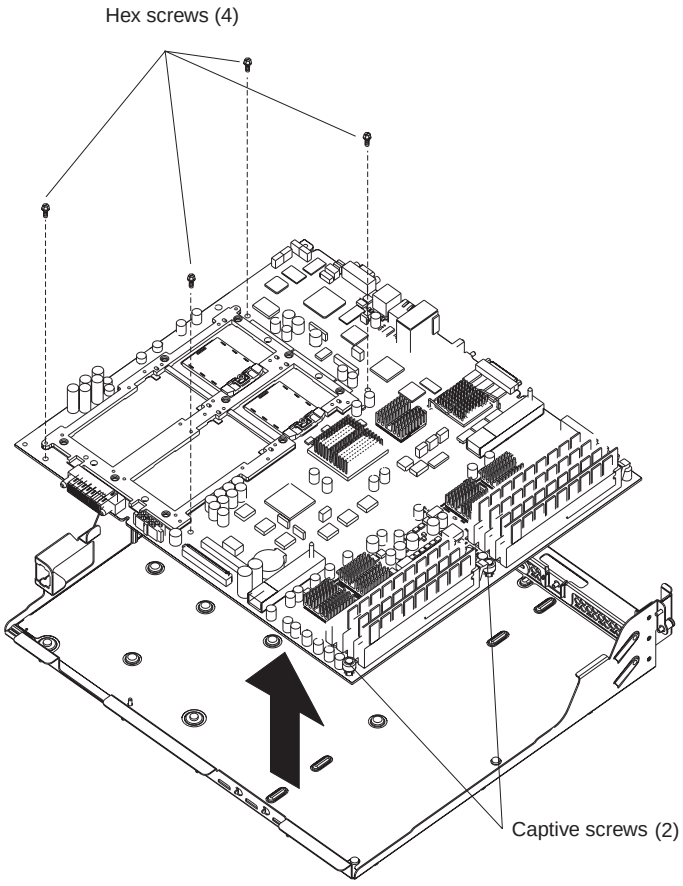
System board removal and replacement

Complete the following steps to remove the system board:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices, see“Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49.
5. Remove the PCI riser assembly, see “PCI riser assembly removal and replacement” on page 57.
6. Remove the fan assembly and air baffle, see “Fan assembly and air baffle removal and replacement” on page 56.
7. Remove the power pods, see “Power pod removal and replacement” on page 75.
8. Remove a microprocessor, see “Microprocessor removal and replacement” on page 74.
9. Remove the memory DIMMs, see “Memory DIMMs removal and replacement” on page 63.
10. Loosen the screw at the rear of the chassis, which secures the retention lever assembly.



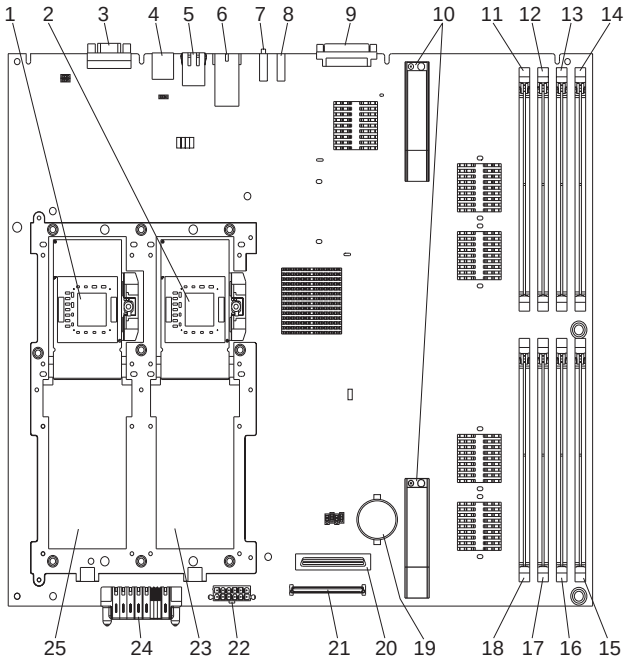
11. Lift the system board from the rear and disengage the interlock tabs at the front; then, remove the system board.



To replace the system board, reverse the previous steps.

Note: To update the programmed system serial number run the BIOS/Firmware update utility. For latest BIOS/Firmware go to http://www.ibm.com/pc/support/.

System board componets



1. Microprocessor 1 (required)
2. Microprocessor 2 (optional)
3. Video connector
4. USB 0 (bottom) and USB 1 (top) connectors
5. Serial connector
6. LAN 1 (bottom) and LAN 2 (top) connector
7. System ID LED
8. System ID button
9. External SCSI connector
10. VHDM connectors (for PCI riser)
11. DIMM connector 8
12. DIMM connector 4
13. DIMM connector 7
14. DIMM connector 3
15. DIMM connector 1
16. DIMM connector 5
17. DIMM connector 2
18. DIMM connector 6
19. Battery
20. Internal SCSI connector
21. IDE/USB/FP connector
22. Power pod power connector
23. Power module 2
24. DC docking connector
25. Power module 1

System board jumpers

There are nine jumper blocks called out on the main board.

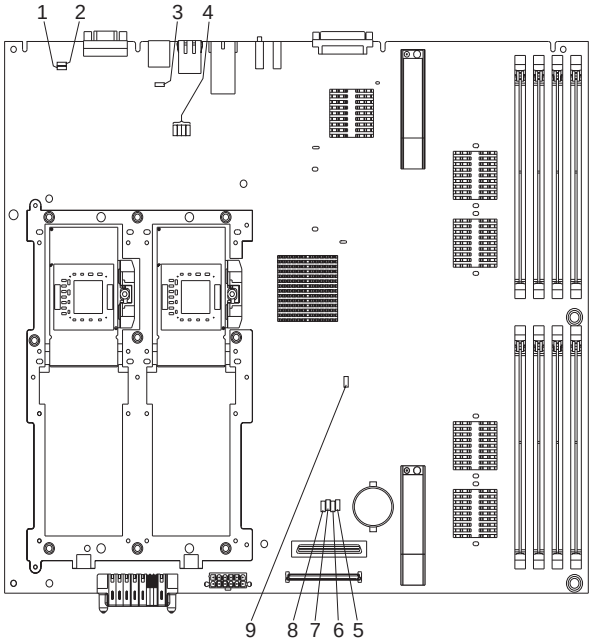


Table 13.

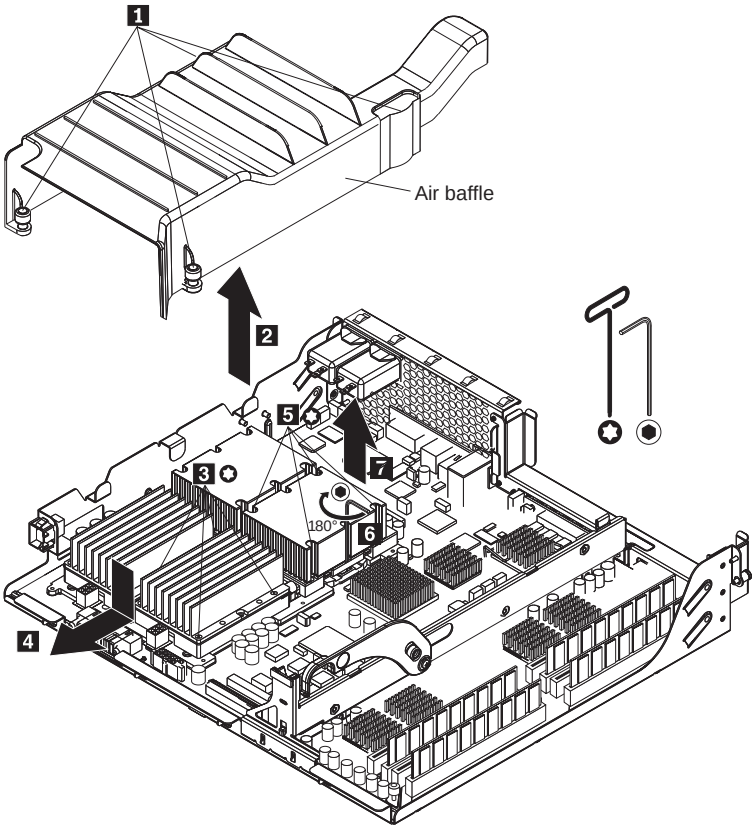
Index	Jumper	Signal / Description
1	J1A1	(RSRL_MODE0) Used to set Serial Port mode. Default is 1-2 on both.
2	J1A2	(RSRL_MODE1) Used to set Serial Port mode. Default is 1-2 on both.
3	J3A3	(SMM_BB_UNPROT_L) Jumper 2-3 to enable programming of the BMC boot block. Default is 1-2.
4	J3B1	(JTAG chain TDI/TDO) JTAG signal routing. Default is 3-4, 5-6, and 7-8 to include SNC-M, SIOH (on the PCI riser board), microprocessor 2, then microprocessor 1.
5	J5H4	BMC Force Update Pin 1-2 default.
6	J5H3	Clear CMOS Pin 1-2 default. Move to 2-3 position to clear.
7	J5H2	Clear password. Move to 2-3 position to clear.
8	J5H1	RCV Boot (Recovery) Pin 1-2 default. Move to 2-3 position for recovery mode.
9	J6G2	(FWH20_ID1_SWAP_L) Swaps North Bridge FWH ID0 and ID2.

Microprocessor removal and replacement

Complete the following steps to remove a microprocessor:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices, see“Turning off the server” on page 9.
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Determine the microprocessor you want to replace.
6. Remove the power pod that is associated with the microprocessor you want to replace (see “Power pod removal and replacement” on page 75).
7. Loosen the four captive screws on the microprocessor.
8. Use a 2.5 mm hex driver to rotate the microprocessor release mechanism 90 degrees counter-clockwise to release the microprocessor’s pins; then, lift the microprocessor out of its socket.

   Note: After the microprocessor is removed and if you are not installing another microprocessor, use a 2.5 mm hex driver to rotate the release mechanism clockwise to the closed position.

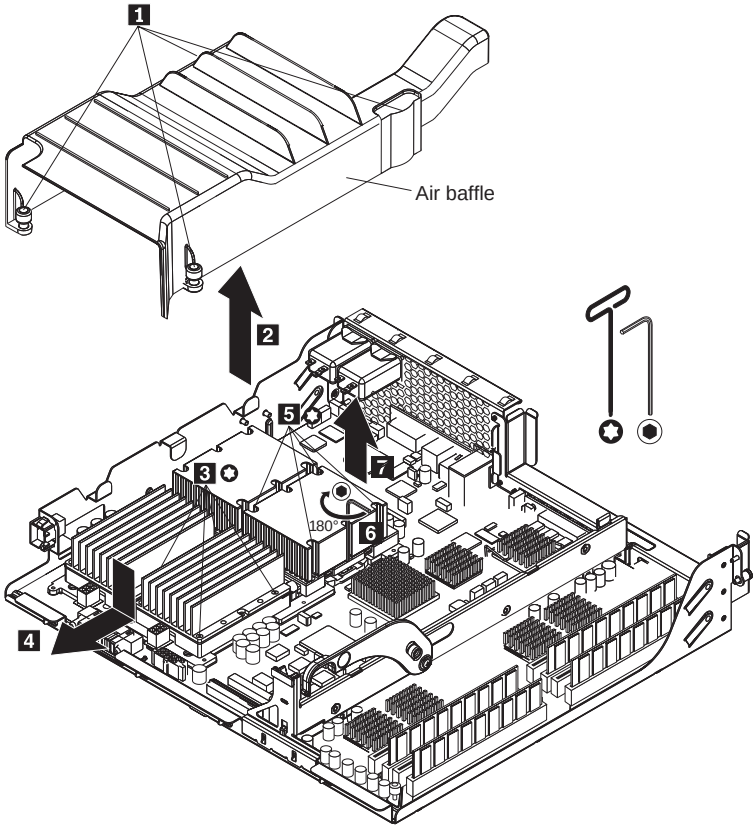


9. To replace a microprocessor, reverse the previous steps.

Power pod removal and replacement

Complete the following steps to remove a power pod:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Turn off the server and all attached devices (see, “Turning off the server” on page 9).
3. Disconnect all external cables and power cords.
4. Remove the cover (see “Cover removal and replacement” on page 49).
5. Remove the fan assembly and air baffle (see “Fan assembly and air baffle removal and replacement” on page 56).
6. Disconnect the Y-cable from the power pod that you want to remove by releasing the connector.
7. Loosen the four captive screws on the power pod; then, slide the power pod away from the microprocessor to disengage the power pod from its connector.



8. Lift the power pod out of the server.

To replace a power pod, reverse the previous steps.

System battery

This section describes how to remove and replace the system battery.

Battery removal and replacement

IBM has designed this product with your safety in mind. The lithium battery must be handled correctly to avoid possible danger. If you replace the battery, you must adhere to the following instructions.

Note: In the U. S., call 1-800-IBM-4333 for information about battery disposal.

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.

To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

Note: After you replace the battery, you must reconfigure your server and reset the system date and time.

Statement 2

CAUTION:
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

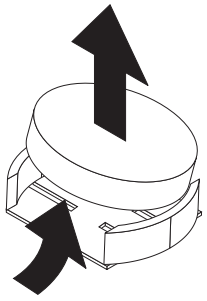
Do not:
- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

Dispose of the battery as required by local ordinances or regulations.

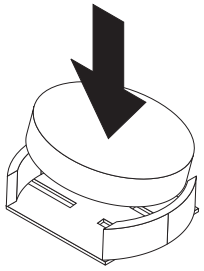
Complete the following steps to remove the battery:

1. Review the “Safety information” on page 95 and “Installation guidelines” on page 43.
2. Follow any special handling and installation instructions supplied with the replacement battery.
3. Turn off the server and all attached devices.
4. Disconnect all power cords; then, disconnect all external cables.
5. Remove the cover (see “Cover removal and replacement” on page 49 and “PCI riser assembly removal and replacement” on page 57).
6. Remove the battery:
   a. Use a fingernail to pop the battery up.

b. Use your thumb and index finger to lift the battery from the socket.



7. Insert the new battery:
   a. Tilt the battery so that you can insert it into the socket.
   b. Press the battery down into the socket until it clicks into place.



8. Replace the PCI riser assembly and replace the cover. (See “Cover removal and replacement” on page 49 and “Cover removal and replacement” on page 49.)
9. Connect all external cables; then, connect the power cords.
10. Turn on the server.
11. Start the Configuration/Setup Utility program and set configuration parameters as needed. See the *User’s Guide* on the IBM *xSeries Documentation* CD.

Chapter 6. Symptom-to-FRU index

This index supports the eServer xSeries x382 Type 8834.

Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. For IBM devices not supported by this index, refer to the manual for that device.
3. Always start with “General checkout” on page 21.

The symptom-to-FRU index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this symptom-to-FRU index to help you decide which FRUs to have available when servicing the server.

The left-hand column of the tables in this index lists error codes or messages, and the right-hand column lists one or more suggested actions or FRUs to replace.

Note: In tables with more than two columns, multiple columns are required to describe the error symptoms.

Take the action (or replace the FRU) suggested first in the list of the right-hand column, then try the server again to see if the problem has been corrected before taking further action.

Note: Try reseating a suspected component or reconnecting a cable before replacing the component.

The POST BIOS code displays POST error codes and messages on the screen.

Beep codes

During POST, problems can occur before video is enabled. These errors are conveyed by encoded beeps, coupled with POST debug codes.

Table 14. Beep codes

Note: See “System” on page 92 to determine which components should be replaced by a field service technician.	
Beeps	**Description**
3 (Memory failure)	**See “Memory” on page 32**.
4 (System Timer)	**See “Microprocessor debug methodology:” on page 33 If symptom persists replace system board.**
5 (Microprocessor Failure)	**See “Microprocessor debug methodology:” on page 33.**
7 (Microprocessor exception interrupt error)	See “Microprocessor debug methodology:” on page 33.
8 (Display memory read/write error)	**Check Add-in video adapter if used, if onboard is used video DRAM may be failing, replace system board.**
9 (ROM Checksum error)	**Corrupted BIOS, Clear CMOS or perform BIOS recovery see, “Clearing CMOS” on page 41and “BIOS recovery mode” on page 42.**
11 (Invalid BIOS)	**Corrupted BIOS, Clear CMOS or perform BIOS recovery see, “Clearing CMOS” on page 41and “BIOS recovery mode” on page 42.**

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Recovery beep codes

Table 15. Recovery beep codes

Note: See “System” on page 92 to determine which components should be replaced by a field service technician.	
Beeps	**Description**
1 short - medium tone	**Medium tone BIOS flash update started.**
2 short - medium tone	**Medium tone BIOS flash update complete.**
Repeating - low tone	**Low tone BIOS recovery error occurred, or no recovery media found.**

BMC generated beep codes

Note: See “System” on page 92 to determine which components should be replaced by a field service technician.	
Beep code	**Description**
1-5-1-1	**See “Microprocessor debug methodology:” on page 33 and “FRB FRU isolation” on page 37.**
1-5-2-1	No processor found in socket 1, **See “Microprocessor debug methodology:” on page 33 and “FRB FRU isolation” on page 37.**
1-5-2-2	No processor found in socket 1, **See “Microprocessor debug methodology:” on page 33 and “FRB FRU isolation” on page 37.**
1-5-2-3	General Microprocessor Issue, **See “Microprocessor debug methodology:” on page 33 and “FRB FRU isolation” on page 37.**
1-5-4-2 (DC voltage error)	1. **Check TPS power supplies for amber lights - replace if found.** 2. Check / replace the power cage.
1-5-4-3 (Chipset control failure)	Chipset control failure.
1-5-4-4 (Voltage error, or dead short (MOST Common cause) i.e. DC to GND)	1. Check the TPS power supplies for amber lights, replace if found. 2. Check Flex Cable for damage (nick in housing) or poor connection. Reseat tor replace the cable. Check all board to board connections i.e. VHDM connectors (riser to system board) carefully look for bent or flattened pins at end of connector near fans. 3. Check / replace power cage.

Error codes - video display

The system BIOS displays POST error messages on the video screen. POST error codes are logged in the SEL. The following table defines POST error codes and their associated messages. The xSeries 382 BIOS prompt you to press a key in case of serious errors.

Some errors are displayed on the screen in red text. These are critical events that require user interaction and the BIOS POST pauses awaiting user input, prompting with a message requesting Press F1, F2, or ESC. This error code type is indicated in the table below as a Yes in the column heading Pause On Boot. This type of error causes the system to pause during system boot. Pausing for user interaction can be overridden in BIOS Setup.

Other error codes are displayed on the screen in yellow. These errors are non-critical and are displayed briefly during POST. These errors are also logged to the SEL. This error code type is indicated in the table below as a No in the column heading Pause On Boot.

Table 16. Error codes/messages

Error code		**FRU/action**
103 (CMOS Battery Failure)	Yes	1. **Check the battery.** 2. Run Setup. 3. Replace the system board.
104 (CMOS Options not Set)	Yes	1. **Check the battery.** 2. Run Setup. 3. Replace the system board.
105 (CMOS Checksum Failure)	Yes	1. **Check the battery.** 2. Run Setup. 3. Replace the system board.
109 (Keyboard Stuck Key)	Yes	1. **Check for stuck key.** 2. Replace the keyboard. 3. Replace the system board.
11B (Date/Time Not Set)	Yes	1. **Check the battery.** 2. Set the date and time. 3. Replace the system board.
120 (CMOS clear)	Yes	1. **Check the clear CMOS jumper J5H3: Normal 1-2, Clear 2-3.** 2. Replace the system board.
121 (Password clear)	Yes	1. **Check the clear password jumper J5H2: Normal 1-2, Clear 2-3.** 2. Replace the system board.
122 (NVRAM cleared by front panel)	Yes	1. **CMOS has been cleared by front panel control sequence. See,** “Clearing CMOS” on page 41**and** “BIOS recovery mode” on page 42**.** 2. Replace the front panel. 3. Replace the system board.

Table 16. Error codes/messages (continued)

Error code		FRU/action
140 (PCI error)	Yes	1. **Check the PCI riser card connectors for pin damage.** 2. Reseat the PCI adapters and retest the server. **Note:** The PCI riser card contains core logic and must be installed to boot the server. 3. Replace the riser card. 4. Replace the system board.
141 (PCI memory allocation error)	Yes.	1. **Memory allocation area for PCI device exceeded. Remove any add-in PCI adapters and retest the server.** 2. Replace any PCI add-in adapters 3. Replace the PCI riser card. 4. Replace the system board.
142 (PCI IO allocation error)	Yes	1. **PCI IO resource allocation for PCI device has been exceeded. Remove any add-in PCI adapters and retest the server.** 2. Replace any PCI add-in adapters 3. Replace the PCI riser card. 4. Replace the system board.
143 (PCI IRQ allocation error)	Yes	1. **PCI IRQ allocation for PCI devices has been exceeded. Remove any add-in PCI adapters and retest the server.** 2. Replace any PCI add-in adapters 3. Replace the PCI riser card. 4. Replace the system board.
0144 (Shadow of PCI ROM failed)	Yes	1. **PCI ROM memory allocation area for PCI devices has been exceeded. Remove any add-in PCI adapters and retest the server.** 2. Replace any PCI add-in adapters 3. Replace the PCI riser card. 4. Replace the system board.
145 (PCI ROM not found)	Yes	1. **PCI ROM memory allocation area for PCI devices has been exceeded or PCI ROM did not have space to load. Remove any add-in PCI adapters and retest the server.** 2. Replace any PCI add-in adapters 3. Replace the PCI riser card. 4. Replace the system board.
146 (Insufficient memory to shadow PCI ROM)	Yes	1. **PCI ROM area exceeded. Remove any add-in PCI adapters and retest the server.** 2. Replace any PCI add-in adapters 3. Replace the PCI riser card. 4. Replace the system board.
8100 (Microprocessor 01 failed BIST)	Yes	**Microprocessor failed to initialize in time, Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**

Table 16. Error codes/messages (continued)

Error code		FRU/action
8101 (Microprocessor 02 failed BIST)	Yes	**Microprocessor failed to initialize in time, Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**
8110 (Microprocessor 01 internal error (IERR)	Yes	**Refer to ″Microprocessor″ in Debug Methodology and FRU Isolation section.** .
8111 (Microprocessor 02 internal error (IERR)	Yes	**Refer to ″Microprocessor″ in Debug Methodology and FRU Isolation section.**
8120 (Microprocessor 01: Thermal trip failure)	Yes	**Microprocessor 01 has exceeded the thermal diode temperature limit resulting in a thermal trip event, check for airflow obstructions to fans & heat sinks. Ensure processor air duct is present and secured. The system is designed to run heavy loads up to 35C or 96F ambient. However, Under normal (i.e. no fan failure) conditions, the CPU should not throttle until 42C/ 107F. (With a fan failure, throttling could possibly occur at about 27C) Thermal trip should occur at 50C /120F, thermal trip will shut down the processor or system. If this occurs and the ambient temp is far cooler - Refer to ″Microprocessor″ in Debug Methodology and FRU Isolation section** .
8121 (Microprocessor 02: Thermal trip failure)	Yes	**Microprocessor 02 has exceeded the thermal diode temperature limit resulting in a thermal trip event, check for airflow obstructions to fans & heat sinks. Ensure processor air duct is present and secured. The system is designed to run heavy loads up to 35C or 96F ambient. However, Under normal (i.e. no fan failure) conditions, the CPU should not throttle until 42C/ 107F. (With a fan failure, throttling could possibly occur at about 27C) Thermal trip should occur at 50C /120F, thermal trip will shut down the processor or system. If this occurs and the ambient temp is far cooler - Refer to ″Microprocessor″ in Debug Methodology and FRU Isolation section.**
8130 (Microprocessor 01 disabled)	Yes	**Microprocessor failed to initialize in time, Refer to Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**
8131 (Microprocessor 02 disabled)	Yes	**Microprocessor failed to initialize in time, Refer to Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**
8140 (Microprocessor 01 failed FRB level 3 timer)	Yes	**Microprocessor failed: Fault Resilient Boot Timer (FRB) expired. Refer to Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**
8141 (Microprocessor 02 failed FRB level 3 timer)	Yes	**Microprocessor failed: Fault Resilient Boot Timer (FRB) expired. Refer to Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**
8150 (Microprocessor 01 failed initialization on last boot)	Yes	**Microprocessor failed to initialize in time, Refer to Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**
8151 (Microprocessor 02 Failed initialization on last boot)	Yes	**Microprocessor failed to initialize in time, Refer to Refer to ″Fault Resilient Boot″ in Debug Methodology and FRU Isolation section.**

Table 16. Error codes/messages (continued)

Error code		FRU/action
8192 (L3 cache size mismatch)	Yes	**BIOS compared Microprocessors & determined an L3 cache mismatch; both processors should run with different cache sizes. If both processors are identical - Refer to ″Microprocessor″ in Debug Methodology and FRU Isolation section.**
8193 (CPUID, Microprocessor Stepping levels are different)	Yes	**BIOS compared Microprocessors & determined a mismatch, both processors may run - If different speeds they will be Performance restricted, both will run at lower of the two speeds, If incompatible - one processor may be disabled. Check stepping & P/N information - Dissimilar stepping processors are not supported. Refer to ″Microprocessor″ in Debug Methodology and FRU Isolation section.**
8196 (Microprocessor models are different)	Yes	**BIOS compared Microprocessors & determined a mismatch, both processors may run - If different speeds they will be Performance restricted, both will run at lower of the two speeds, If incompatible - one processor may be disabled. Check stepping & P/N information - Dissimilar stepping & mixed family processors are not supported. Refer to "Microprocessor" in Debug Methodology and FRU Isolation section.**
8197 (Microprocessor speed mismatched	Yes	**BIOS compared Microprocessors & determined mismatched speeds, both processors will be Performance restricted, both will default to run at lower of the two speeds. If both processors are identical - Refer to "Microprocessor" in Debug Methodology and FRU Isolation section.**
8210 (Microprocessor 01 late self test failed: Performance restricted)	Yes	**Failure identified in late self-test, Microprocessor 1 will be Performance restricted. Refer to "Microprocessor Late Self test" in Debug Methodology and FRU Isolation section.**
8211 (Microprocessor 02 late self test failed: Performance restricted)	Yes	**Failure identified in late self-test, Microprocessor 2 will be Performance restricted. Refer to "Microprocessor Late Self test" in Debug Methodology and FRU Isolation section.**
8220 (Microprocessor 01 late self test failed: Functionally restricted)	Yes	**Failure identified in late self-test, Microprocessor 1 will be Functionally restricted. Refer to "Microprocessor Late Self test" in Debug Methodology and FRU Isolation section.**
8221 (Microprocessor 02 late self test failed: Functionally restricted)	Yes	**Failure identified in late self-test, Microprocessor 2 will be Functionally restricted. Refer to "Microprocessor Late Self test" in Debug Methodology and FRU Isolation section.**
8230 (Microprocessor 1 late self test failed: Catastrophic failure)	Yes	**Failure identified in late self-test, Microprocessor 1 will be disabled. Refer to "Microprocessor Late Self test" in Debug Methodology and FRU Isolation section.**
8231 (Microprocessor 2 late self test failed: Catastrophic failure)	Yes	**Failure identified in late self-test, Microprocessor 1 will be disabled. Refer to "Microprocessor Late Self test" in Debug Methodology and FRU Isolation section.**
8300 (Baseboard management controller (BMC) failed to function)	Yes	1. **Check to see that the jumper at J5H4 is in position 1-2 =normal, (position 2-3 is update mode).** 2. Replace the system board

Table 16. Error codes/messages (continued)

Error code		FRU/action
8306 (OS boot watchdog timer failure)	Yes	**System exceeded 6-minute watchdog timer on boot cycle. Refer to "Watch dog timer" for details.**
84F3 (BMC in Update Mode)	Yes	**Check to see that the jumper at J5H4 is in position 1-2 =normal, (position 2-3 is update mode).If Issue persists replace Minipark.**
84FF (System event log full)	Yes	**The System Event Log is Full, Save or Clear SEL, See section on "Thresholding"**
8500 (Multi-bit error detected in row 1. Row 1 mapped out)	Yes	**The multi-bit error is detected on a DIMM(s) in Row 1; Row disabled, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
8501 (Multi-bit error detected in row 2. Row 2 mapped out)	Yes	**The multi-bit error is detected on a DIMM(s) in Row 2; Row disabled, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
8504 (Persistent single-bit error detected Row 1. Row 1 mapped out)	Yes	**Issue with DIMM address or data line likely affecting multiple DIMMs (otherwise ECC should recover) in Row 1; Row disabled, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
8505 (Persistent single-bit error detected in row 2. Row 2 mapped out)	Yes	**Issue with DIMM address or data line likely affecting multiple DIMMs (otherwise ECC should recover) in Row 2; Row disabled, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
8508 (Memory mismatch detected in row 1. Row 1 mapped out	Yes	**Issue with DIMM SPD value in Row 1; Row disabled, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
8509 (Memory mismatch detected in row 2. Row 2 mapped out)	Yes	**Issue with DIMM SPD value in Row 2; Row disabled, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
850C (DIMM 1 defective)	Yes	**Issue with DIMM 1=J9J3, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
850D (DIMM 2 defective)	Yes	**Issue with DIMM 2=J9J1, Refer to "Memory" in Debug Methodology and FRU Isolation section.**
850E (DIMM 3 defective)	Yes	**Issue with DIMM 3=J9D3, See memory in Debug Methodology and FRU Isolation section.**
850F (DIMM 4 defective)	Yes	**Issue with DIMM 4=J9D1, See memory in Debug Methodology and FRU Isolation section.**
8510 (DIMM 5 defective)	Yes	**Issue with DIMM 5=J9J2, See memory in Debug Methodology and FRU Isolation section.**
8511 (DIMM 6 defective)	Yes	**Issue with DIMM 6=J8J1, See memory in Debug Methodology and FRU Isolation section.**
8512 (DIMM 7 defective)	Yes	**Issue with DIMM 7=J9J2, See memory in Debug Methodology and FRU Isolation section.**
8513 (DIMM 8 defective)	Yes	**Issue with DIMM 8=J8D1, See memory in Debug Methodology and FRU Isolation section.**

Error symptoms

You can use the error symptom table to find solutions to problems that have definite symptoms.

If you cannot find the problem in the error symptom charts, go to “EFI-based SELViewer task” on page 23 to test the server.

If you have just added new software or a new option and your server is not working, do the following before using the error symptom charts:

- Remove the software or device that you just added.
- Run the diagnostic tests to determine if your server is running correctly.
- Reinstall the new software or new device.

In the following table, if the entry in the FRU/action column is a suggested action, perform that action; if it is the name of a component, reseat the component and replace it if necessary. The most likely cause of the symptom is listed first.

Table 17. Error symptoms

Note: See “System” on page 92 to determine which components should be replaced by a field service technician.		
Symptom	**Cause**	**FRU/action**
System does not power up.	• Power cords not plugged in or faulty. • Boards not fully seated. • Power supplies not installed correctly.	1. Check power cords to ensure that they are not damaged and are installed correctly 2. Verify that modules are seated properly. 3. Verify that power supplies are installed correctly
System powers on, but then turns off, often with fault light.	• Short on one of the boards due to conductive item touching it. • Bent pins on connectors.	1. Check to make sure that you haven’t dropped a screw or other conductive item into the system during the upgrade. 2. Check the connections on all boards. Begin with those connections that gave you the most trouble during installation. That is typically where a pin may have gotten bent. 3. Check for bent pins on VHDM connectors. Check for bent pins on processors.
System powers up but does not complete POST.	• Boards, power pods, or processors not fully seated. Wrong stepping of microprocessor in system for the BIOS. • System speed set higher than processors installed support. • Memory not stuffed in documented order or unsupported/validated DIMMS used.	1. Check seating on all boards, power pods and processors. Make sure you have the FSB to CPU core ratio set appropriately for the processors you’re using. 2. Check the BIOS release notes to ensure the BIOS installed on the platform supports the stepping and family of the processors currently installed. 3. Check that you have stuffed the memory banks in the proper order. See system documentation for proper stuffing options. 4. Use only validated DIMMS at least until you’ve made sure your upgrade has gone successfully prior to testing an unknown.

Table 17. Error symptoms (continued)

Note: See “System” on page 92 to determine which components should be replaced by a field service technician.		
Symptom	**Cause**	**FRU/action**
System does not recognize all the processors you installed.	• Microprocessors or power pods not fully seated. • Power cable from microprocessor board to power pod not fully seated. • Power pod not fully engaged into microprocessor. • Bent pins on microprocessor.	1. Check seating on processors and power pods. 2. Verify that you don’t have any bent microprocessor pins. 3. Check the power cable from microprocessor board to power pod connections.
No video, but the system is not stuck in reset	DIMM not functional.	1. Check seating of DIMMs. Replace DIMMs. 2. Ensure proper population of DIMM banks.
SCSI drives are not recognized during POST.	Drive not fully seated.	Check the hard disk drive connections.
CD ROM not recognized by BIOS/EFI.	IDE cable or power cable not connected to drives.	1. Ensure the drive is properly connected to the adapter. 2. Check that BIOS setup has the device set to enable.

Power supply LED errors

Each power supply module has a bi-color LED that indicates the status of the module.

Table 18. Power supply LEDs

PWR(Power) Green LED	**PFAIL(Predictive Failure)Amber LED**	**FAIL(Power Supply Failure)Amber LED**	**Description**
Off	Off	Off	No AC power to any power supplies.
Off	Off	On	No AC power to a specific power supply or power supply failure.
Blinking	Off	Off	AC present / standby output on.
On	Off	Off	DC outputs on and okay.
On	Off	Blinking	Current limit.
On	Blinking	Off	Predictive failure.

SCSI error codes

Error code	**FRU/action**
All SCSI Errors One or more of the following might be causing the problem: • A failing SCSI device (adapter, drive) • An improper SCSI configuration • Duplicate SCSI IDs in the same SCSI chain	• **Verify that the SCSI devices are configured correctly.**

Undetermined problems

Use the information in this section if the diagnostic tests did not identify the failure, the devices list is incorrect, or the system is inoperative.

Notes:

1. Damaged data in CMOS can cause undetermined problems. To reset the CMOS, remove the battery for 15 minutes, and then reinstall the battery.
2. Damaged data in BIOS code can cause undetermined problems.
   - Flash the system with the latest BIOS code.
   - If the system appears inoperative, recover the BIOS (see “BIOS recovery mode” on page 42).

Check the LEDs on all the power supplies of server. If the LEDs indicate the power supplies are working correctly, complete the following steps:

1. Check that the front panel is connected to the system board.
2. If no LEDs on the front panel are working, replace the front panel; then, try to power up the server.
3. Turn off the server.
4. Remove the server cover.
5. Remove or disconnect the following devices (one at a time) until you find the failure (reinstall, turn on and reconfigure the server each time):
   - I/O adapter
   - Drives
   - Memory modules (minimum requirement = four 256 MB DIMMs)

   Note: Minimum operating requirements are:
   a. System board
   b. One microprocessor
   c. Memory (with a minimum of four 256 MB DIMMs)
   d. Two power supplies
   e. PCI riser assembly
   f. Front panel board
   g. SCSI backplane
   h. Power pod
6. Turn on the server. If the problem remains, suspect the following FRUs in the order listed:
   - DIMM
   - System board
   - Riser board
   - SCSI backplane
   - Front panel board
   - Microprocessor

Notes:

1. If the problem goes away when you remove an I/O adapter from the system and replacing that I/O adapter does not correct the problem, suspect the system board.
2. If you suspect a networking problem and all the system tests pass, suspect a network cabling problem external to the system.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Microprocessor or hard disk upgrades
- Failure symptom
  - Do diagnostics fail?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Diagnostics version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS level
- Operating system software
  - Type and version level

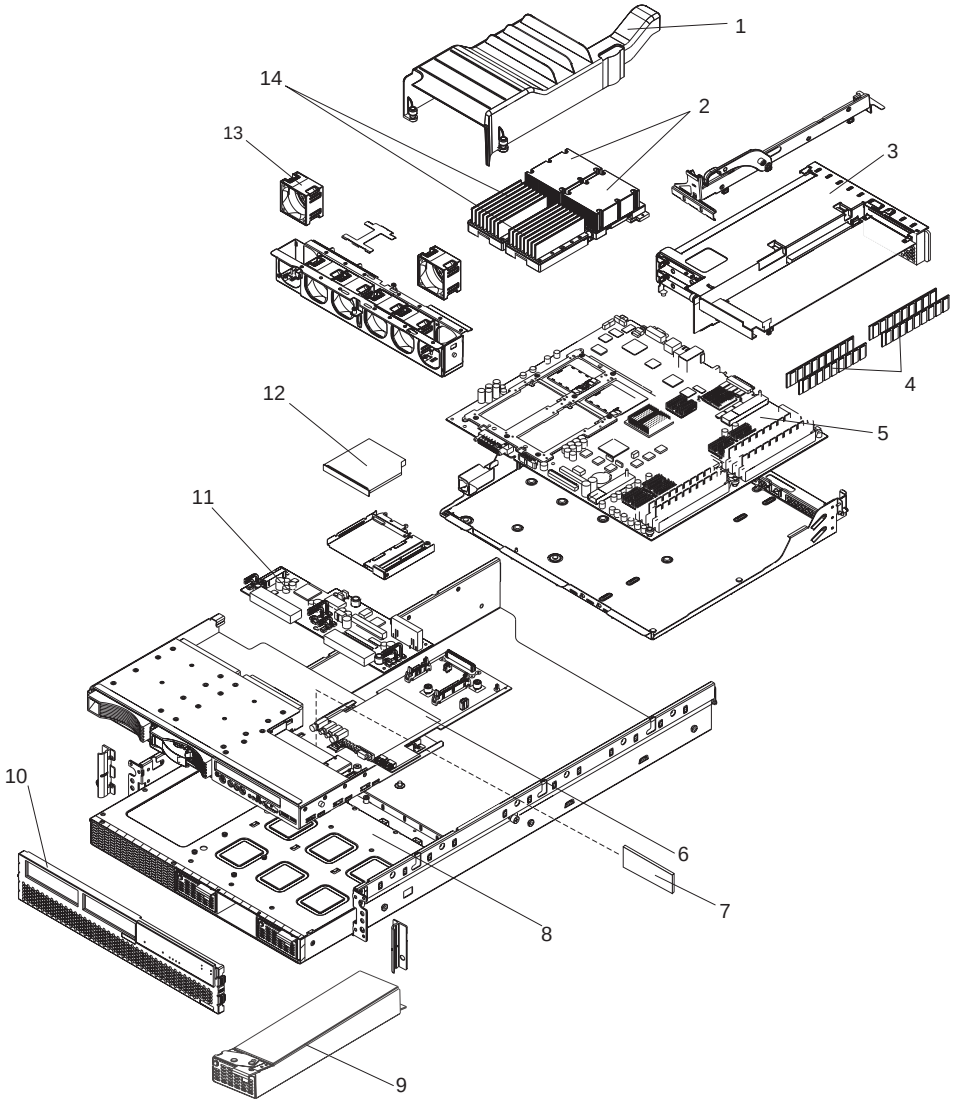
Note: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS and firmware levels
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same diagnostics code (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between “working” and “non-working” systems will often lead to problem resolution.

Chapter 7. Parts listing, x382 Type 8834 (models 11X and 32X)

This parts listing supports the xSeries x382 Type 8834 server.



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System

Note: Field replaceable units (FRUs) should be serviced only by qualified field service technicians. Customer replaceable units can be replaced by the customer.

Index	System	FRU No.	CRU/FRU
1	Air baffle (all models)	73P9952	FRU
2	Microprocessor, 1.5GHz 6MB (model 32X)	73P9968	FRU
3	PCI riser card assembly (all models)	02R3494	FRU
4	Memory, 512KB, ECC (all models)	09N4307	FRU
5	System board (all models)	02R3493	FRU
6	Front panel (all models)	73P9949	FRU
7	IDE card (all models)	73P9948	FRU
8	Power cage (all models)	73P9950	FRU
9	Power supply (all models)	02R3492	CRU
10	Bezel, (all models	73P9953	FRU
11	SCSI backplane (all models)	02R3495	FRU
12	DVD drive (CD/RW) (all models)	33P3283	FRU
13	Fan assembly (all models)	73P9945	FRU
14	Power pod (all models)	73P9947	FRU
	Battery (all models)	04G5389	FRU
	Cable management arm (all models)	73P9961	FRU
	Chassis kit, (all models)	73P9962	FRU
	Flex cable (all models)	73P9955	FRU
	Hard disk drive (all models)	32P0730	CRU
	IDE cable (all models)	73P9946	FRU
	Jumper cord (all models)	36L8886	FRU
	Miscellaneous parts kit (all models)	73P9963	FRU
	Perifial power cable (all models)	73P9958	FRU
	SCSI cable (all models)	73P9957	FRU
	Signal cable (all models)	73P9956	FRU
	Slide rail kit (all models)	73P9960	FRU

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation® system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM Support Web site at http://www.ibm.com/pc/support/ to check for technical information, hints, tips, and new device drivers.
- Use an IBM discussion forum on the IBM Web site to ask questions.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/pc/support/ and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is http://www.ibm.com/eserver/xseries/. The address for IBM IntelliStation information is http://www.ibm.com/pc/intellistation/.

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You can find service information for your IBM products, including supported options, at http://www.ibm.com/pc/support/.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, go to http://www.ibm.com/services/, or go to http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to http://www.ibm.com/planetwide/ for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. Related service information

The service procedures are designed to help you isolate problems. They assume that you have model-specific training on all servers, or that you are familiar with the servers, functions, terminology, and service information provided in this manual.

Safety information

The following section contains the safety information that you need to be familiar with before servicing an IBM server.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

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Electrical safety

CAUTION:
Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.

    Remember: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

    Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

  Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.
- Regularly inspect and maintain your electrical hand tools for safe operational condition.

- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Switch off power.
  - Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Turn off the server. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. The power cord should be the appropriate type as specified in the parts listings.
   c. Insulation must not be frayed or worn.

4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling static-sensitive devices

Any server part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD), or static-sensitive. ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the server, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling static-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a properly grounded wrist strap against your skin to help eliminate static electricity from your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling static-sensitive devices.
- Select a grounding system, such as those in the following list, to provide protection that meets the specific service requirement.

  Note: The use of a grounding system is desirable but not required to protect against electrostatic discharge damage.

  – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  – Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
  – Use the round ground-prong of the ac plug on ac-operated servers.

Grounding requirements

Electrical grounding of the server is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices (multilingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Brazilian/Portuguese
- Chinese
- French
- German
- Italian
- Japanese
- Korean
- Spanish

Important: All caution and danger statements in this IBM documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements before performing any of the instructions.

Statement 1:

DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect:	To Disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 2:

CAUTION:
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

Dispose of the battery as required by local ordinances or regulations.

Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

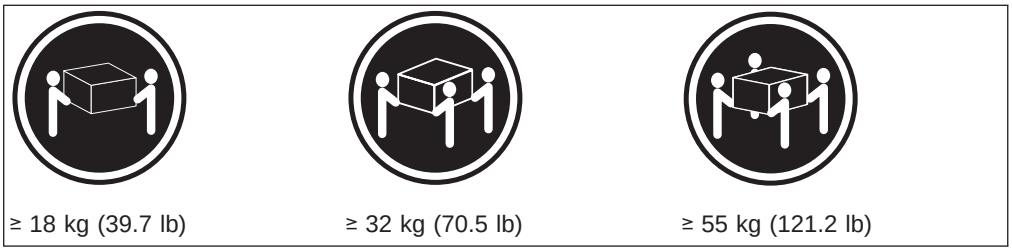
- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4:

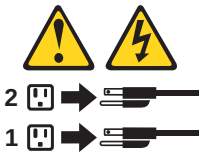


CAUTION:
Use safe practices when lifting.

CAUTION:
Use safe practices when lifting.

Statement 5:

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 23:

CAUTION:
Do not place any object weighing more than 50 kg (110 lb) on top of rack-mounted devices.

>50 kg (110 lb)

Importante:

Todas as instruções de cuidado e perigo da IBM documentation começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

Instrução 1

PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	**Para Desconectar:**
1. DESLIGUE Tudo. 2. Primeiramente, conecte todos os cabos aos dispositivos. 3. Conecte os cabos de sinal aos conectores. 4. Conecte os cabos de alimentação às tomadas. 5. LIGUE os dispositivos.	1. DESLIGUE Tudo. 2. Primeiramente, remova os cabos de alimentação das tomadas. 3. Remova os cabos de sinal dos conectores. 4. Remova todos os cabos dos dispositivos.

Instrução 2

CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um móídulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de mídulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:
- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

Instrução 3

PRECAUCIÓN:

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ítica, transmissores, etc.) estiverem instalados, observe o seguinte:
- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos íticos, e evite exposição direta ao raio.

Instrução 4

≥18 kg (37 lbs)

≥32 kg (70.5 lbs)

≥55 kg (121.2 lbs)

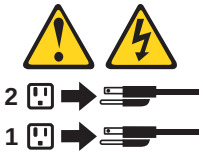
CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5

CUIDADO:

Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



CUIDADO:

Instrução 8

CUIDADO:

Nunca remova a tampa de uma fonte de alimentação ou de qualquer peça que tenha esta etiqueta afixada.

Níveis perigosos de voltagem, corrente e energia estão presentes em qualquer componente que tenha esta etiqueta afixada. Nenhuma peça localizada no interior desses componentes pode ser consertada. Se você suspeitar de algum problema em alguma dessas peças, entre em contato com um técnico IBM.

Instrução 10

CUIDADO:

Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.

重要:

Server Library 中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如，如果一个提醒条款前的数字为 1，则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前，请确保您已经阅读了全部提醒和危险条款。

声明 1

危险

电源、电话和通信电缆中带有危险电流。

为避免电击：

雷电期间不要拆接电缆或安装、维修及重新配置本产品。

将所有电源线连接至正确布线并已安全接地的电源插座上。

将应与本产品连接的所有设备连接至正确布线的插座上。

尽量只使用单手拆接信号电缆。

有水、火及结构损坏迹象时，请勿打开任何设备。

除非在安装配置过程中有明确指示，否则，打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。

安装、移动或打开本产品及其附带设备的机盖时，应按下表所述连接和断开电缆。

连接时:	断开连接时:
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆连接至设备。	2. 首先从插座中拔出电源线。
3. 将信号电缆连接至接口。	3. 从接口上拔下信号电缆。
4. 将电源线连接至插座。	

声明 2

警告:

更换锂电池时，只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池，则只能使用同一厂商制造的同一类型的模块进行更换。电池中含有锂，如果使用、拿放或处理不当，可能会发生爆炸。

请勿对电池进行下列操作：
扔入或浸入水电　　。
加热超过 100 （212 F）
进行修理或分解
请按本地法规要求处理电池。

声明 3

警告:

安装激光产品（如 CD-ROM、DVD 驱动器、光纤设备或送话器）时，应注意以下事项：

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险，本设备中没有用户可维修的部件。

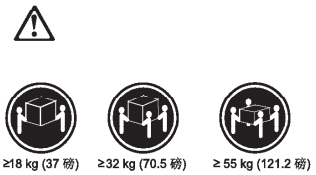
非此处指定的其它控制、调整或与性能有关的操作都有可能导致激光辐射的危险。

危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。

打开时会产生激光辐射。不要直视光束，不要使用光学仪器直接观看光束，避免直接暴露于光束之下。

声明 4

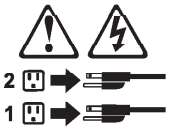


警告：
抬起时请采用安全操作方法。

声明 5

警告：

使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。另外，本设备可能带有多条电源线。如要断开设备上的所有电流，请确保所有电源线均已与电源断开连接。



声明 6

警告：

如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至使用方便的电源。

声明 7

警告：

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8

警告：
不要拆除电源外盖或贴有下列标签的任何部件。

贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9

警告：

为避免人员伤害，拆除设备上的风扇前应拔下热插拔风扇电缆。

声明 10

警告：

机柜安装的设备上面不能放置重于 82kg（180 磅）的物品。

>82 kg (180 磅)

重要資訊：

> ***Server Library*** 中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。
>
> 例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。
>
> 執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

聲明 1

危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：	切斷：
1. 關閉所有開關。	1. 關閉所有開關。
2. 先將所有電纜線接上裝置。	2. 先自電源插座拔掉電源線。
3. 將信號電纜接上接頭。	3. 拔掉接頭上的所有信號電纜。
4. 再將電源線接上電源插座。	4. 再拔掉裝置上的所有電纜線。
5. 開啓裝置的電源。	

聲明 2

注意：

更換鋰電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 ℃ (212 ℉)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3

注意：

安裝雷射產品 (如 CD-ROM、DVD 光碟機、光纖裝置或發射器) 時，請注意下列事項：

- 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
- 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。

危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

聲明 4

≥ 18 公斤 (37 磅)

≥ 32 公斤 (70.5 磅)

≥ 55 公斤 (121.2 磅)

注意：

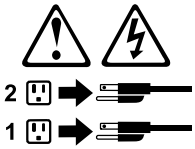
抬起裝置時，請注意安全措施。

聲明 5

注意：

裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。

本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 8

注意：

嚴禁移除電源供應器的蓋子，或任何貼有下列標籤的組件。

貼有此標籤的元件內均有危險的電壓、電流及能源。這些元件中沒有需要維修的組件。若察覺問題發生在上述組件時，請與服務人員聯絡。

聲明 10

注意：

請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。

> 82 公斤 (180 磅)

聲明 13

危險

分支電路超載可能會引發火災，在特定情況下會有電擊之虞。為避免這些危險發生，請確定您的系統電力需求不超過分支電路的保護需求。請參閱 IBM 電力規格裝置所附的資訊。

聲明 14

注意：
可能會有危險的電壓、電流或能源量。僅授權合格的維修技師在貼上以下標籤之處移除外殼。

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque IBM documentation sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Notice n° 1

DANGER

Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

Pour éviter tout risque de choc électrique:

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion	Déconnexion
1. Mettez les unités hors tension. 2. Commencez par brancher tous les cordons sur les unités. 3. Branchez les câbles d'interface sur des connecteurs. 4. Branchez les cordons d'alimentation sur des prises. 5. Mettez les unités sous tension.	1. Mettez les unités hors tension. 2. Débranchez les cordons d'alimentation des prises. 3. Débranchez les câbles d'interface des connecteurs. 4. Débranchez tous les câbles des unités.

Notice n° 2

ATTENTION:

Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- **Ne la jetez pas à l'eau.**

- **Ne l’exposez pas à une température supérieure à 100 °C.**
- **Ne cherchez pas à la réparer ou à la démonter.**

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.

Notice n° 3

ATTENTION:

Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:

- **N’ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l’intérieur.**
- **Pour éviter tout risque d’exposition au rayon laser, respectez les consignes de réglage et d’utilisation des commandes, ainsi que les procédures décrites dans le présent document.**

DANGER

Certains produits laser contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. évitez de regarder fixement le faisceau ou de l’observer à l’aide d’instruments optiques. évitez une exposition directe au rayon.

Notice n° 4

≥18 kg (37 lbs)

≥32 kg (70.5 lbs)

≥55 kg (121.2 lbs)

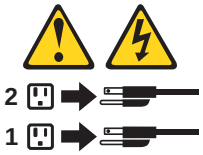
ATTENTION:

Faites-vous aider pour soulever ce produit.

Notice n° 5

ATTENTION:

Le bouton de mise sous tension/hors tension de l’unité et l’interrupteur d’alimentation du bloc d’alimentation ne coupent pas l’arrivée de courant électrique à l’intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d’alimentation. Pour isoler totalement l’unité du réseau électrique, débranchez tous les cordons d’alimentation des socles de prise de courant.



Notice n° 8

ATTENTION:

N’ouvrez jamais le bloc d’alimentation ou tout élément sur lequel e apposée l’étiquette ci-dessous.

Des tensions et des courants dangereux sont présents à l’intérie de tout composant sur lequel est apposée cette étiquette. Ces éléments ne peuvent pas être réparés. Si vous pensez qu’ils peuvent être à l’origine d’un incident, prene contact avec un technicien de maintenance.

Notice n° 10
ATTENTION:

Ne posez pas d’objet dont le poids dépasse 82 kg sur les unités montées en armoire.

Wichtig:

Alle Sicherheitshinweise in dieser IBM documentation beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1

VORSICHT

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.
- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder öffnen von Gehäusen von Personal servern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	**Kabel lösen:**
1. Alle Geräte ausschalten und Netzstecker ziehen. 2. Zuerst alle Kabel an Einheiten anschließen. 3. Signalkabel an Anschlußbuchsen anschließen. 4. Netzstecker an Steckdose anschließen. 5. Gerät einschalten.	1. Alle Geräte ausschalten. 2. Zuerst Netzstecker von Steckdose lösen. 3. Signalkabel von Anschlußbuchsen lösen. 4. Alle Kabel von Einheiten lösen.

Hinweis 2

ACHTUNG:

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:
- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3

ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie folgendes.

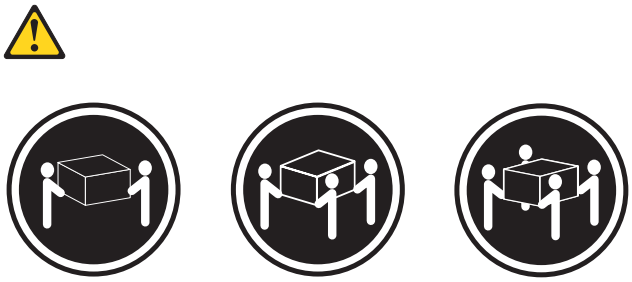
- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.

VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

Hinweis 4



≥18 kg ≥32 kg ≥55 kg

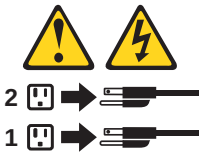
ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5

ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des Servers und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Servers auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



Hinweis 8

ACHTUNG:

Die Abdeckung oder eine Komponente eines Netzteils, die wie nachfolgend aufgeführt gekennzeichnet ist, darf keinesfalls entfernt werden.

In Komponenten, die so gekennzeichnet sind, können gefährliche Spannungen anliegen. In diesen Komponenten sind keine Teile vorhanden, die vom Benutzer gewartet werden müssen. Besteht der Verdacht, dass an einem dieser Teile ein Fehler aufgetreten ist, ist ein IBM Kundendiensttechniker zu verständigen.

Hinweis 10
ACHTUNG:

Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione IBM documentation iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1

PERICOLO

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	**Per scollegare:**
1. SPEGNERE tutti i dispositivi. 2. Collegare prima tutti i cavi alle unità. 3. Collegare i cavi di segnale ai connettori. 4. Collegare i cavi di alimentazione alle prese elettriche. 5. ACCENDERE le unità.	1. SPEGNERE tutti i dispositivi. 2. Rimuovere prima i cavi di alimentazione dalle prese elettriche. 3. Rimuovere i cavi di segnale dai connettori. 4. Rimuovere tutti i cavi dalle unità.

Avviso 2

ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:
- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3

ATTENZIONE:

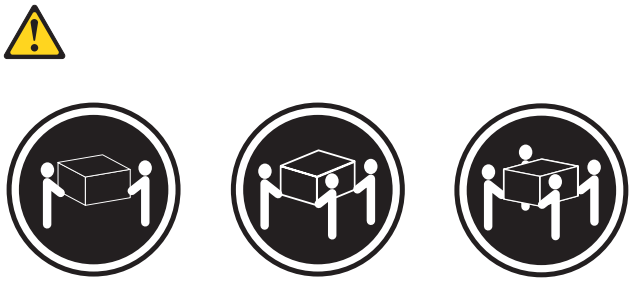
Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:
- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.

PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 4



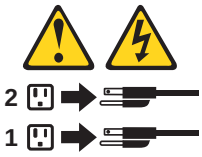
ATTENZIONE:

Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5

ATTENZIONE:

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



Avviso 8

ATTENZIONE:

Non togliere mai il coperchio di un alimentatore o qualsiasi parte su cui è posta la seguente etichetta.

Tensioni pericolose, corrente e livelli di energia sono presenti all'interno del componente su cui è posta questa etichetta. All'interno di questi componenti non vi sono parti su cui effettuare l'assistenza tecnica. Se si sospetta un problema in una di queste parti, rivolgersi ad un tecnico di manutenzione.

Avviso 10
ATTENZIONE:

Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.

重要：

Netfinity Server　ライブラリーにあるすべての注意および危険の記述は
数字で始まります。この数字は、英語版の注意および危険の記述と翻訳さ
れた注意および危険の記述を相互参照するために使用します。

例えば、もし注意の記述が数字の 1 で始まってる場合は、その注意の翻訳は、
記述 1　の下にあります。

手順を実施する前に、すべての注意;

・記述 1

⚠ 危険

感電を防止するため、雷の発生時には、いかなるケーブルの取り付けまたは取り外しも行わないでください。また導入、保守、再構成などの作業も行わないでください。

感電を防止するため ：

- 電源コードは正しく接地および配線が行われている電源に接続してください。
- 本製品が接続されるすべての装置もまた正しく配線された電源に接続されている必要があります。

できれば、信号ケーブルに取り付けまたは取り外しのときは片方の手のみで行うようにしてください。これにより、電位差がある二つの表面に触ることによる感電を防ぐことができます。

電源コード、電話ケーブル、通信ケーブルからの電流は身体に危険を及ぼします。設置、移動、または製品のカバーを開けたり装置を接続したりするときには、以下のようにケーブルの接続 、取り外しを行ってください。

接続するには	取り外すには
1. すべての電源を切る 2. まず、装置にすべてのケーブルを接続する。 3. 次に、通信ケーブルをコネクターに接続する 4. その後、電源コンセントに電源コードを接続する 5. 装置の電源を入れる。	1. すべての電源を切る 2. まず、電源コンセントから電源コードを取り外す 3. 次に、通信ケーブルをコネクターから取り外す。 4. その後、装置からすべてのケーブルを取り外す

・記述 2

⚠ 注意

本製品には、システム・ボード上にリチウム電池が使用されています。電池の交換方法や取り扱いを誤ると、発熱、発火、破裂のおそれがあります。
電池の交換には、IBM部品番号33F8354の電池またはメーカー推奨の同等の電池を使用してください。
交換用電池の購入については、お買い求めの販売店または弊社の営業担当までお問い合わせください。
電池は幼児の手の届かない所に置いてください。
万一、幼児が電池を飲み込んだときは、直ちに医師に相談してください。
以下の行為は絶対にしないでください。
－水にぬらすこと
－100度C 以上の過熱や焼却
－分解や充電
－ショート
電池を廃棄する場合、および保存する場合にはテープなどで絶縁してください。他の金属や電池と混ざると発火、破裂の原因となります。電池は地方自治体の条例、または規則に従って廃棄してください。ごみ廃棄場で処分されるごみの中に捨てないでください。

・記述 3

⚠ 注意

レーザー製品(CD-ROM、DVD、または光ファイバー装置または
送信器など)が組み込まれている場合は、下記に御注意ください。

- ここに記載されている制御方法、調整方法、または性能を超えて使用すると、危険な放射線を浴びる可能性があります。
- ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。ドライブの内部に修理のために交換可能な部品はありません。カバーを開けないでください。

⚠ 危険

一部 CD-ROM ドライブは、Class 3A または Class 3B レーザー・ダイオードを使用しています。 次の点に注意してください。

CD-ROMドライブのカバーを開けるとレーザーが放射されます。光線をみつめたり、光学器械を使って直接見たりしないでください。また直接光線を浴びないようにしてください。

・記述 4

⚠ 注意

18Kg 以上

32Kg 以上

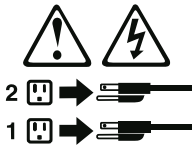
55Kg 以上

装置を持ち上げる場合は、安全に持ち上げる方法に従ってください。

・記述 5

⚠ 注意 ⚠

サーバーの前面にある電源制御ボタンは、サーバーに供給された電流を遮断しません。
サーバーには、複数の電源コードが接続されているかもしれません。
サーバーから電流を完全に遮断するために、すべての電源コードが電源から取り外されていることを確認してください。



・記述 8

⚠ 注意

この機器のなかにある電源のカバーは取り外さないでください。
また、下記のラベルが貼られているいかなる部品（電源のバック・
プレーンおよびＡＣボックス）も取り外さないでください。

電源、電源のバックプレーンおよび AC ボックスの内部には
危険な電圧、電流およびエネルギーがあり危険です。
電源、電源のバックプレーンおよび AC ボックスの内部には
保守部品はありません。
これらの部品に問題があるときは販売店または保守サービス会社
にご連絡ください。

・記述 23

⚠ 注意

ラック・モデルのサーバーの上に 50 Kg 以上の物を置かないで
ください。

> 50 Kg

중요:

본 *Server Library*에 있는 모든 주의 및 위험 경고문은 번호로 시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는 번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의 경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을 읽으십시오.

경고문 1

위험

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 철수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 켜지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원거리 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:	연결을 끊으려면:
1. 모든 스위치를 끕니다.	1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.	2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에 연결합니다.	3. 신호 케이블을 커넥터에서 제거합니다.
4. 콘센트에 전원 코드를 연결합니다.	4. 장치에서 모든 케이블을 제거합니다.
5. 장치 스위치를 켭니다.	

경고문 2

주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리에 리튬이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음을 주의하십시오.

- 던지거나 물에 담그지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3

주의:
레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 유의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.

위험

일부 레이저 제품에는 클래서 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

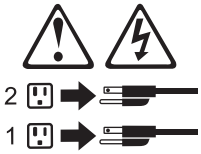
경고문 4

≥18 kg (37 lbs) ≥ 32 kg (70.5 lbs) ≥ 55 kg (121.2 lbs)

주의:
기계를 들 때는 안전하게 들어 올리십시오.

경고문 5

주의:
장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는 지 확인하십시오.



경고문 8

주의:
다음 레이블이 붙어 있는 전원 공급기나 부품의 덮개를 제거하지 마십시오.

이 레이블이 부착되어 있는 컴포넌트 안에는 위험한 전압, 전류 및 에너지 레벨이 있습니다. 이 컴포넌트 안에는 서비스 받을 수 있는 부품이 없습니다. 이를 부품에 문제가 있을 경우 서비스 기술자에게 문의하십시오.

경고문 23

주의:
서랍형 모델의 장치 상단에 50 kg(110 lbs.)이 넘는 물체를 올려 놓지 마십시오.

> 50 kg (110 lbs)

Importante:

Todas las declaraciones de precauciín de esta IBM documentation empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaraciín de precauciín o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta secciín.

Por ejemplo, si una declaraciín de peligro empieza con el número 1, las traducciones de esta declaraciín de precauciín aparecen en esta secciín bajo Declaraciín 1.

Lea atentamente todas las declaraciones de precauciín y peligro antes de llevar a cabo cualquier operaciín.

Declaración 1

PELIGRO

La corriente eléctrica de los cables telefínicos, de alimentaciín y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalaciín, mantenimiento o reconfiguraciín de este producto durante una tormenta.
- Conecte cada cable de alimentaciín a una toma de alimentaciín eléctrica con conexiín a tierra y cableado correctos.
- Conecte a tomas de alimentaciín con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de sent.al.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundaciín o de daños estructurales.
- Desconecte los cables de alimentaciín, sistemas de telecomunicaciones, redes y mídems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalaciín y configuraciín.
- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operaciín de instalaciín, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexin	**Para la desconexiín**
1. APÁGUELO todo. 2. En primer lugar, conecte los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Conecte cada cable de alimentaciín a la toma de alimentaciín. 5. ENCIENDA el dispositivo.	1. APÁGUELO todo. 2. En primer lugar, retire cada cable de alimentaciín de la toma de alimentaciín. 3. Retire los cables de señal de los conectores. 4. Retire los cables de los dispositivos.

Declaración 2

PRECAUCIÓN:

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un mídulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de mídulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:
- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislaciín local.

Declaración 3

PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra íptica o transmisores), tenga en cuenta las advertencias siguientes:

- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiaciín láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realizaciín de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposiciín perjudicial a las radiaciones.

PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiaciín láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ípticos; evite la exposiciín directa al rayo.

Declaración 4

≥18 kg

≥32 kg

≥55 kg

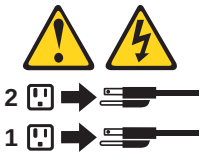
PRECAUCIÓN:

Tome medidas de seguridad al levantar el producto.

Declaración 5

PRECAUCIÓN:

El botín de control de alimentaciín del dispositivo y el interruptor de alimentaciín de la fuente de alimentaciín no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentaciín. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentaciín de la fuente de alimentaciín.



Declaración 8

PRECAUCIÓN:

No retire nunca la cubierta de una fuente de alimentación ni ninguna pieza que tenga adherida la etiqueta siguiente.

Existen niveles perjudiciales de energía, corriente y voltaje en los componentes que tienen adherida esta etiqueta. Dentro de estos componentes no existe ninguna pieza que requiera mantenimiento. Si sospecha que alguna de estas piezas tiene un problema, póngase en contacto con un técnico de servicio.

Declaración 23

PRECAUCIÓN:

No coloque ningún objeto que pese más de 50 kg (110 libras) encima de los dispositivos montados en bastidor.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. ***Lávese las manos después de usar el producto.***

Appendix C. Notices

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PS/2
ServeRAID
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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. For country-specific instructions, refer to the following Web site: http://www.ibm.com/ibm/environment/products/prp.shtml.

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio

communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits.IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwanese Class A warning statement

警告使用者:
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Chinese Class A warning statement

声　　明
此为 A 级产品。在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に
基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を
引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求
されることがあります。

Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
02K0546	China
13F9940	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
13F9979	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Republic, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (People's Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
13F9997	Denmark
14F0015	Bangladesh, Lesotho, Maceo, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
14F0033	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dominica, Gambia, Ghana, Grenada, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Polynesia, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad and Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Italy, Libyan Arab Jamahiriya
14F0087	Israel
1838574	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Caicos Islands, Canada, Cayman Islands, Costa Rica, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Japan, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Taiwan, United States of America, Venezuela
24P6858	Korea (Democratic People's Republic of), Korea (Republic of)
34G0232	Japan

IBM power cord part number	Used in these countries and regions
36L8880	Argentina, Paraguay, Uruguay
49P2078	India
49P2110	Brazil
6952300	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Caicos Islands, Canada, Cayman Islands, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Taiwan, United States of America, Venezuela

Index

A

AC power LED 6
AC-R power LED 6
AC1 power LED 6
AC2 power LED 6
acoustical noise emissions 3
adapter
  considerations 50
  full-length 50
  half-length 50
  installing 60
  PCI 50
  PCI bus 50
  PCI bus, identification 50
  removing 60
  replacing 60
  specifications 3
air baffle
  removing 56
  replacing 56
air-baffle assembly, illustration 10
attention notices 1

B

battery
  removing 76
  replacing 76
battery connector 12
bay identification, hot-swap drive 46
bezel
  installing 47
  removing 45
  replacing 47
BIOS update 17, 20

C

cable, connectors 13, 15
cabling
  connectors on back 48
  system-board external connectors 15
  system-board internal connectors 13
caution statements 1
CD ROM drive
  removing 51
CD-ROM drive
  eject button 6
  specifications 3
Class A electronic emission notice 137
components
  major 10
  system board 12
configuration
  Configuration/Setup Utility 17
  Ethernet 20
  LSI Logic Configuration Utility 17
configuration *(continued)*
  ServeRAID programs 17
  updating 48
Configuration/Setup Utility 17
  starting 17
Configuration/Setup Utility program 17
connectors
  adapter 12
  battery 12
  cable 13
  external port 15
  internal cable 13
  memory 12
  microprocessor 12
  port 15
  system board 12
  VRM 12
controls and indicators 6, 7
cooling 3
cover
  removing 49

D

danger statements 1
data rate, Ethernet 20
DC power LED 6
device driver, update 5
DIMM connector
  installing memory 63
  locations 63
DIMM retaining clips 64
diskette drive
  specifications 3
drive
  hot-swap
    bay identification 46
    installing 46
    support 46
DVD/CD-RW drive
  activity LED 6

E

eject button
  CD-ROM 6
electrical input 3
electronic emission Class A notice 137
environment 3
error codes
  beep codes 79
  BMC generated beep codes 80
  recovery beep codes 80
  SCSI 87
  video display 81
Ethernet
  activity LED 6, 7

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Ethernet *(continued)*
configuring 20
high performance modes 20
integrated on system board 20
modes 20
teaming 20
Ethernet controller, configuration 17
Ethernet controller, configuring 20

F

fan
removing 52
fan assembly
removing 56
replacing 56
FCC Class A notice 137
features
server 4
features, server 3
filler panel, hard disk drive bay 46
formatting a hard disk using LSI Logic Configuration 19
front panel board
removing 65

H

handling static-sensitive devices 44
hard disk drive
activity/failure LED 6, 7
status LED 6
heat output 3
hot-swap and hot-plug devices
drives 10, 46
fans 10
power supplies 54, 55
hot-swap drive
bay identification 46
installing 46
specifications 3
hot-swap fan
removing 52
hot-swap power supply
installing 55
replacing 54

I

ID LED 7
important notices 1
installing
adapters 60
bezel 47
hot-swap drive 46
hot-swap power supply 55
options 43
PCI riser 59
internal
drive bays 45

J

jumpers
system board 73

L

LED errors
power supply 87
LEDs
AC power 6
AC-R power 6
AC1 power 6
AC2 power 6
DC power 6
DVD/CD-RW activity 6
Ethernet activity 6, 7
hard disk drive activity 6
hard disk drive activity/failure 6, 7
hard disk drive status 6
ID 7
power-on 7
PS1 power 6
PS2 power 6
system fault 7
system status 7
system status/fault 7
LSI Logic Configuration Utility 17
description 18
formatting a hard disk 19
starting 18

M

major components 10
memory
modules 63
specifications 3
memory DIMMs
removing 63
replacing 63
memory module
specifications 3
messages
SCSI error 41
microprocessor
removing 74
replacing 74
specifications 3
modes, Ethernet 20

N

notes 1
notes, important 136
notices
electronic emission 137
FCC, Class A 137
notices and statements 1

O

options, installing 43

P

PCI
  adapters 50
  expansion slots 50
PCI expansion slots 3
PCI riser 10
  replacing 59
PCI riser assembly
  removing 57
peripheral bay
  removing 67
  replacing 67
port, connectors 15
power cords 139
power supply
  LED errors 87
  operating requirements 54
  replacing 54
power supply bay
  removing 68
  replacing 68
power supply specifications 3
power switch 7
power-control button 7
power-on LED 7
problem solving 21
PS1 power LED 6
PS2 power LED 6

R

removing
  adapter 60
  battery 76
  bezel 45
  CD ROM drive 51
  cover 49
  fan 52
  front panel board 65
  memory DIMMs 63
  microprocessor 74
  PCI riser assembly 57
  peripheral bay 67
  power supply bay 68
  SCSI backplane 66
  system board 70
replace
  battery 76
  bezel 47
  hot-swap power supply 54
  PCI riser 59
replacing
  adapter 60
  memory DIMMs 63
  microprocessor 74
  peripheral bay 67
replacing *(continued)*
  power supply bay 68
  SCSI backplane 66
  system board 70
reset button 7
reset switch 7
retaining clips, DIMM 64

S

SCSI
  error codes 87
SCSI backplane
  removing 66
  replacing 66
SCSI connector location 13
SCSI error messages 41
SCSI, IDs 47
SD/INT button 7
SD/INT switch 7
ServeRAID Manager
  description 19
  overview 19
  startable-CD mode 20
ServeRAID programs 17
size 3
SMP 1
specifications 3
startable-CD mode 20
starting
  LSI Logic Configuration Utility 18
  the server 8
statements and notices 1
static electricity 44
static-sensitive devices, handling 44
symmetric multiprocessing 1
system board
  connectors
    external port 15
    internal cable 13
    SCSI 13
  jumpers 73
  removing 70
  replacing 70
system fault LED 7
system reliability 43
system status LED 7
system status/fault LED 7

T

temperature 3
trademarks 136
turning on the server 8

U

United States electronic emission Class A notice 137
United States FCC Class A notice 137
update device drivers 5

using
  IBM Configuration/Setup Utility program 17
utility
  Configuration/Setup 17
  LSI Logic Configuration 18
  ServeRAID Manager 19

V

video 3
video controller 3

W

Web site
  compatible options 43
  IBM server products 1
weight 3
World Wide Web 1

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